NOVEMBER 23, 1953

Electrical World

Price 35 Cents

A McGRAW-HILL PUBLICATION

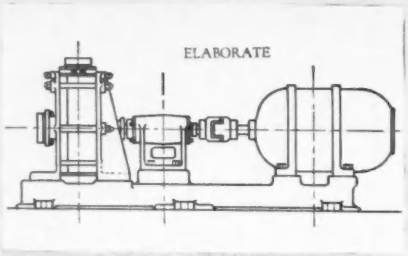
They Wrote the Book at AG&E

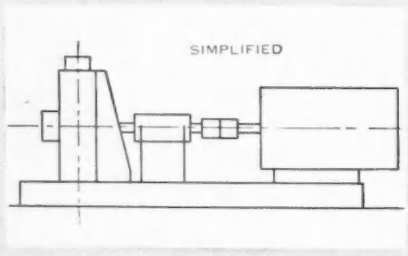
See Page 16

SIMPLIFICATION REDUCES 57 SQ FT OF BLUEPRINT TO 4 SQ FT says A. H. Rau, Manager, Drafting Services to General Electric draftsmen. He and W. L. Healy, Supervisor, Technical Services—Switchgear Department co-authored "Simplified Drafting Practice."

Simplified drafting practice promises savings up to 50% in time, money and materials

New Drafting Technique Helps Relieve Manpower Shortage





COMPARISON BETWEEN elaborate and simplified techniques demonstrates ease of showing standard parts.

NEW BOOK, "Simplified Drafting Practice," John Wiley & Sons, gives details.

Simplification cuts time

In face of today's acute shortage of engineers, electric utility companies can make better use of their skilled drafting manpower through a revolutionary new technique for cutting the time spent by draftsmen painstakingly drawing standard components again and again. This also allows more creative analysis of problems—a higher use of a draftsman's ability.

This can be achieved by applying the modernized drafting techniques as used by industrial companies. Industry has found that simplified drafting saves up to 50% in time, reduces amounts of drawing and blueprint papers, and provides quicker reading and interpretation.

One-line simplification

Throughout the electrical industry, simple, uncomplicated one-line diagrams already are used and accepted as a basic approach to visualizing complex engineering problems. By employing standard symbols and abbreviations, the one-line diagram simplifies both the job of preparation and understanding.

Today's drafting practices by comparison make for extremely complicated, voluminous, detailed mechanical drawing, often incorporating many standard components.

New approach

Two General Electric engineers, W. L. Healy and A. H. Rau, long experienced in the electrical field, have developed a new and simplified approach, that offers measurable savings, in a new book, "Simplified Drafting Practices." Their system eliminates non-essential "frills" without sacrificing clarity and accuracy of engineering information for manufacturing, assembling or installation personnel.

Reduced to fundamentals this new approach saves time and effort by (1) Simplification of delineation, (2) Elimination of non-essentials, and (3) More extensive use of free-hand drawing.

For more details, write for APF-71C to: General Electric Company, Section 301-248, Schenectady 5, N. Y.

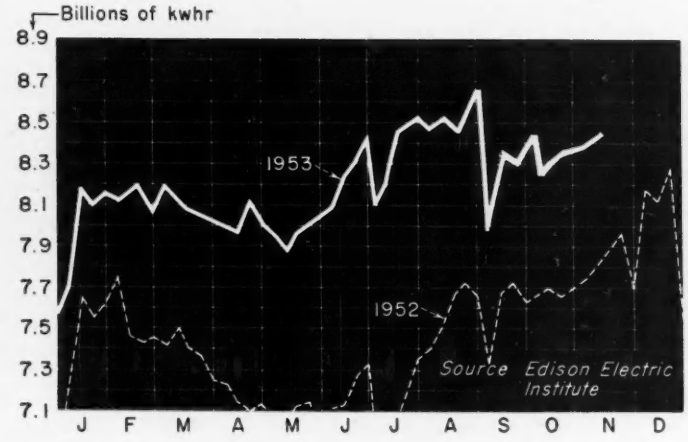
MORE POWER TO AMERICA

GENERAL ELECTRIC

VOLUME 140, NO. 21

November 23, 1953

Electrical World



Output Week Ended Nov. 14—8,457,342,000 Kwhr

Per Cent Change From Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
Nov. 14	+7.3	+3.0	+3.4	+1.7	+5.7	+19.3	+2.3	+6.6	+21.9	+4.5
Nov. 7	+7.6	+5.4	+3.0	+1.9	+5.5	+18.8	+3.0	+6.9	+23.1	+6.5
Oct. 31	+7.9	+5.9	+3.5	+3.1	+5.9	+18.9	+3.8	+6.5	+22.9	+4.4

Electric Power Statistics

		Latest Month	Preceding Month	Year Ago
Peak Load (Million Kw)	Aug.	77.1	76.8	69.7
Capacity (Million Kw)	Sept.	87.59	86.63	78.76
Production (Billion Kwhr)	Sept.	37.04	38.50	33.38
Hydro	Sept.	7.59	8.45	7.36
Fuel	Sept.	29.45	30.04	26.02
Fuel Consumption				
Coal (Million Tons)	Sept.	9.70	9.70	8.84
Oil (Million Barrels)	Sept.	6.16	6.55	6.05
Gas (Billion Cu Ft)	Sept.	105.30	112.88	96.38
Sales (Billion Kwhr)	Aug.	32.82	32.13	29.39
Residential	Aug.	8.48	8.47	7.53
Commercial	Aug.	5.98	5.81	5.46
Industrial	Aug.	15.83	15.50	14.10
Other	Aug.	2.52	2.35	2.30
Net Income Class A & B Companies ($ Million)	Sept.	81.20*	77.43	74.14
Estimated Dec. '53 Peak (Million Kw)	Aug.	86.2	86.2	88.4
Kwhr per Residential Customer (12 Month Average)	Aug.	2,289	2,273	2,119
Revenue per Kwhr Residential Service (12 Month Average)	Aug.	2.76¢	2.76¢	2.77¢
Canadian Production (Billion Kwhr)	Aug.	5.09	5.18	4.97

Business Statistics

FRB Industrial Production Index†††	Sept.	236*	238**	232
Gross National Product Annual Rate ($ Billion)	2ndQtr.	372.4	362.0	345.1
EW 5 Industry Production Index	Sept.	128.9	129.2	125.8
ENR Construction Cost Index††	Nov.	128.1	128.0	123.4
BLS Consumer's Price Index	Sept.	115.2	115.0	114.1
NEMA Insulation Materials Sales Index†	Sept.	153	153	142
NEMA Electric Appliance Sales Index†	Sept.	101	90	105
NEMA Household Refrig. Sales Index†	Sept.	62	63	69

*Preliminary **Revised †1947-49=100 ††1949=100 †††Unadjusted

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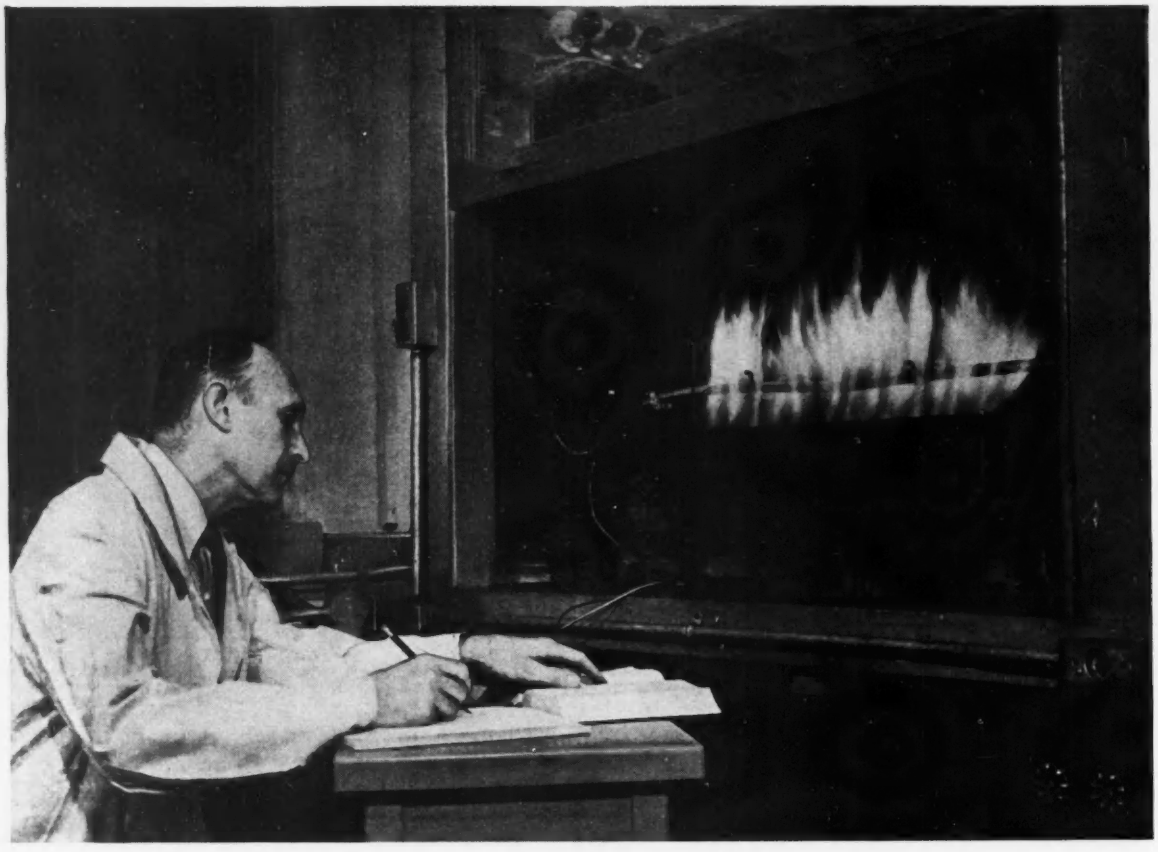


New cable withstands 1400 F flame for 24 hours in grueling laboratory test.

Protect vital circuits against fire with new G-E control cable

Silicone-rubber insulation adds years to life of cable used in high-temperature applications.

General Electric's new control cable, for installation in extremely high ambients, will maintain circuit integrity even in case of severe fire along the cable run. In addition to withstanding heat (maximum ambient temperature for continuous operation is 257 F), the new G-E cable has an insulation that has the moisture resistance of the best grades of rubber—a combination never before possible.

No special tools or fittings are required to handle the new cable. Installation practice is generally the same as with any other rubber-type cable.

For vital control circuits in power stations, around boiler rooms, or in high-temperature processing operations, you should investigate G-E cable number SI-58134. See your G-E Wire and Cable specialist, or write to Section W88-1127, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.

You can put your confidence in—

GENERAL ELECTRIC

THE ELECTRICAL WEEK

The Issue's News Highlights—SPA is preparing a rate schedule for submission to Interior next month. New rates may be 20% higher in some cases. Another problem for SPA is drought conditions which may mean a drastic curtailment of output at federal projects in Southwest.

APPA charged Hoover Commission's task force on power and water resources is stacked against public power . . . Puget Sound P&L decided to continue operating as a separate entity, breaking off merger negotiations with WWP and purchase plans of PUD's in the state.

Southwest Power Cooperative was scheduled to be incorporated in Oklahoma City last week by 160 distribution cooperatives in Texas, Oklahoma, Arkansas, and Kansas to put co-ops in the area in a better position to deal for any power facilities the government might dispose of in the future. Announced aim of the group is: "To finance the purchase of existing federal lines and facilities, to construct facilities for generating and delivering power where needed, and to purchase blocks of power from federal, municipal and private sources, and to arrange to wheel and deliver power to rural electric cooperatives." About 60 co-ops in Missouri and Louisiana are also considering joining.

Private companies in the Pacific Northwest may in the future pool their resources to build large hydroelectric projects, but Congress will have to advance funds to provide navigation and flood control features. This view was expressed to nine journalists on a NAEC-sponsored tour of controversial power areas by Thomas W. Delzell, board chairman of Portland (Ore.) General Electric Co.

In San Francisco the group heard James Black, president of Pacific G&E, say federal aid was necessary in building a commercial-sized power reactor because of the "unknown aspects" of the undertaking. How much this aid should be, he said, may come out of current talks between AEC and the industry team of which PG&E is a part.

Canada has selected the two men who will work with two representatives chosen by the U. S. (EW, Nov. 16, p 106) as members of St. Lawrence River Joint Board of Engineers. They are Lionel Chevrier, Minister of Transport, and R. A. C. Henry, an authority on Seaway engineering problems. The board will coordinate plans for the long-delayed, much disputed hydro project, on which test borings have begun.

General Electric Co sales this year will exceed $3 billion, Pres Ralph J. Cordiner told security analysts in New York.

Members of Local 175, UWU-CIO, agreed to accept a 5% boost in pay from Dayton Power & Light Co. One-year pact, signing of which ended several weeks of negotiation, provides for an improved pension plan. It affects 1,600 workers.

Off the Washington Wire—A preliminary "proposal" for transfer of the federal government's Central Valley Project plus Folsom Dam to the State of California was made to a state delegation by Department of Interior. Secretary Douglas McKay pointed out Congressional action would be needed to complete sale of the project, ultimate cost of which is estimated at $890 million.

U. S. Court of Appeals is studying a motion to speed court action on suits filed to invalidate New York State's license to build the St. Lawrence Power Project.

AEC's Spoon River explosives processing plant, recently cancelled, would have required 6,000 to 7,000 kw of power. Negotiations with Central Illinois Public Service Co were underway when construction of the plant was brought to a halt.

REA is reported to have approved a proposed settlement in the long-muddled East Kentucky Co-op transmission situation. Settlement involved some 23 interconnections between co-op and company systems. The electric companies in the area had wanted to lease and operate co-op lines on an integrated basis.

Eric Johnston's plan, drawn by Tennessee Valley Authority, for cooperative use of the waters of the Jordan Valley system of Jordan, Syria, and Israel, has been turned down flatly by Jordan. The New York Times quoted Jordan's premier as saying, "This government will consider no scheme involving departure of its policy of no peace with Israel."

Superior Court in Pennsylvania killed a PUC order directing West Penn Power Co to cut rates by $1,663,840 annually and make rebates to customers totaling $2.4 million. Ruling means 325,000 consumers will continue to pay an increase that went into effect Oct. 29, 1951.

Presaging more vigorous opposition to Idaho Power's three-dam plan on the Snake River, National Hells Canyon Association filed incorporation papers with the State of Oregon. Its statement of intentions declares it intends to promote federal development of the Snake. FPC's Hells Canyon hearing resumes today.

A plan to exchange 5½ shares of Gatineau Power Co common for one share of International Hydro Electric Co preferred was approved by a U. S. District Court in Boston. International Hydro will become an investment company if later stages of the plan are approved.

Largest single power contract ever negotiated in Canada was consummated by Quebec Hydro-Electric Commission and Shawinigan Water & Power Co. Under it, Quebec Hydro, a public body, will sell Shawinigan, a private utility, 400,000 hp from Hydro's huge development on the Bersimis River.

Detroit Edison Co has received FPC approval to export 250 million kwhr to Hydro-Electric Power Commission of Ontario.

(*Continued on page* 10)

SPA Tale: Up Rates, Low Water

Interior marketing agency in Southwest is preparing new schedule of charges. Drought threatens to curtail output

Higher rates, low water—these are the current features of the federal power marketing situation in the Southwest.

A new and appreciably higher rate schedule is in the works for power sold from the government-built hydroelectric projects in the area. Southwestern Power Administration, the marketing agency, may hike some rates by 20% or more (see Table I) to bring revenue in line with capital and operating costs. Officials are working against an early December deadline to put the higher schedule before SPA's parent agency, the Interior Department.

Another side of the picture is a general drought in the watersheds which feed the government hydroelectric projects on SPA's main grid. This is already trimming output of the projects and threatens drastic curtailment if continued into next year. River flows in the vicinity of four projects contributing to the SPA system ranges from 67% down to 24% of the average monthly flow for the first ten months of this year (see Table II).

SPA's power marketing area covers large portions of Oklahoma, Texas and Arkansas and reaches into Missouri and Louisiana.

Big Boost in Prospect

SPA Administrator Douglas G. Wright has been telling power customers for months that government rates in the area are to be increased substantially. But to date he has been unable to say precisely just how much the rate will be raised. His bosses at Interior Department in Washington will have the final say on the rate schedule that will go to Federal Power Commission for approval.

In general it is expected that SPA rates to preference customers (municipals, REA co-ops, etc), for round-the-clock power will go up from the present 5.6 mills per kwhr to around 7 mills per kwhr. This power is made available to public bodies either directly or through a series of wheeling contracts between SPA and electric companies in Texas and Oklahoma. Under these contracts, SPA delivers peaking hydro power to the companies which, in turn, deliver firm power to SPA customers.

I—Higher Rates

Average Rates for SPA Power

(Per Kwhr)

	Present	Proposed
Sales to electric companies (peaking power)	7 mills	7.75 mills
Sales to preference customers	5.6 mills	7 mills

For firm peaking power sold to electric companies in the SPA area, the average government power rate is expected to be raised from around 7 mills to 7.75 or 8 mills.

Even these increases, Wright is convinced, will not meet the exacting conditions of the Army Corps of Engineers for paying off the government power investments in the dams from which SPA sells power.

The Army Engineers plan to pay off the power investment over a period of 50 years with an interest of 3%. Under the rate increases being discussed, there would have to be some flexibility in the repayment plan. The pay-out period could be extended over a period of 60 or 75 years, or the interest trimmed to 2% or less.

Wright argues that the corps has consistently underestimated the cost of flood control-power projects in the Southwest—thus helping to push power rates sky high.

The Fort Gibson Project was originally authorized to cost an estimated $13 million with $8 million allocated to power. Actual cost of the dam was $47.5 million with some $25 or $30 million allocated to power. This means SPA is faced with recovering twice as much for the power features of Fort Gibson as the entire dam was originally estimated to cost.

Dual Bookkeeping

Until now the SPA rates have been kept down by a dual system of bookkeeping used under Democratic Administrations. Under this procedure, one set of cost allocations is used by the Corps of Engineers in getting water power projects authorized. An entirely different set of cost allocations and methods is used in computing power rates for these projects.

Inconsistency of this method has been pointed out by a special House Public Works subcommittee in a report issued last December (EW, Dec. 22, '52, p 8) and in an audit made this year by the comptroller general.

Under law, SPA rates are subject to approval by FPC, and date for submission of the rate schedule is now set for Dec. 31. Thus far SPA has been operating under interim FPC rate approval.

There is a chance, however, that Interior Secretary Douglas Mckay may ask still a further extension of the interim rate schedule. If so it would probably be on the grounds that Congress may act next session to standardize cost allocations for water projects—giving Interior a definite guide for fixing SPA rates.

Also complicating the SPA power picture is a prolonged and general drought in the watersheds behind the government water projects in the Southwest. SPA reports water levels well below normal in all the government reservoirs which supply SPA's main system.

The Fort Gibson project, which has

II—Low Water

River Flow at Federal Power Dams in Southwest

Per Cent of Normal—First Ten Months 1953

Dam	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Total Period
Denison	14	15	66	36	22	16	88	56	17	155	44
Narrows	80	84	125	207	266	18	500	4	13	4	119
Bull Shoals	24	18	142	83	84	12	20	5	1	5	58
Norfolk	52	41	134	79	79	36	50	46	46	34	67
Ft. Gibson*	26	19	57	44	35	15	18	12	2	4	24

* Regulated by upstream Pensacola Reservoir

no storage, has been shut down much of the time during the past month. Flow for this project is regulated by the upstream Pensacola Reservoir, which is owned and operated by an Oklahoma state agency.

The Pensacola Reservoir has been drawn down 25 ft below the top of its power pool. As of last week the water elevation at the reservoir stood at 718.61 ft above sea level—a bare 8 ft above the bottom of its power pool.

Rains in early November considerably improved the water situation at the federally owned Denison Dam in Texas, and will enable it to carry a larger share of the SPA load.

Water conditions at the Narrows Dam in Arkansas have been good, but this project is operated separately from the SPA grid system. Power from Narrows is sold en bloc to Southwestern Gas & Electric Co for use in its system.

Top hydraulic engineer at SPA sums up the water situation like this: "We are managing to struggle along now. You might say we are bent. If the drought continues through next spring, we will come near to being broke."

Hoover 'Task Force' Assailed

APPA and Cooperative League charge 26-man group is weighted against public power. Unit to hold first session this week

New 26-man Hoover Commission task force on power and water resources gets down to work this week.

Its job is to define the proper role of the federal government in power and water resource development and recommend specific changes needed to fit federal agencies for this role.

Charges already have been made that public power has no sympathizers on the task group.

American Public Power Association, in a recent statement, said "We strongly suspect that the task force will be concerned largely with specifying means of implementing Mr Hoover's own recommendation that the government get completely out of the power business."

Cites Public Power Foes . . . Alex Radin, general manager of APPA, pointed out that whereas there were no public power supporters in the 26-man task force, the group did contain a large number of persons who have clear records of opposition to public power.

'Grave Danger' Is Seen . . . The Cooperative League of the U.S.A. has charged that the present make-up of the commission's power task force is more than stacked against the consumer. The league said there was "grave danger" the study would be used as a "device to turn the natural water resources of the country over to the power interests."

Headed by Admiral Ben Moreell, chairman of the board of Jones & Laughlin Steel Corp, the group meets for the first time Nov. 23 to map out its work. It is expected to produce

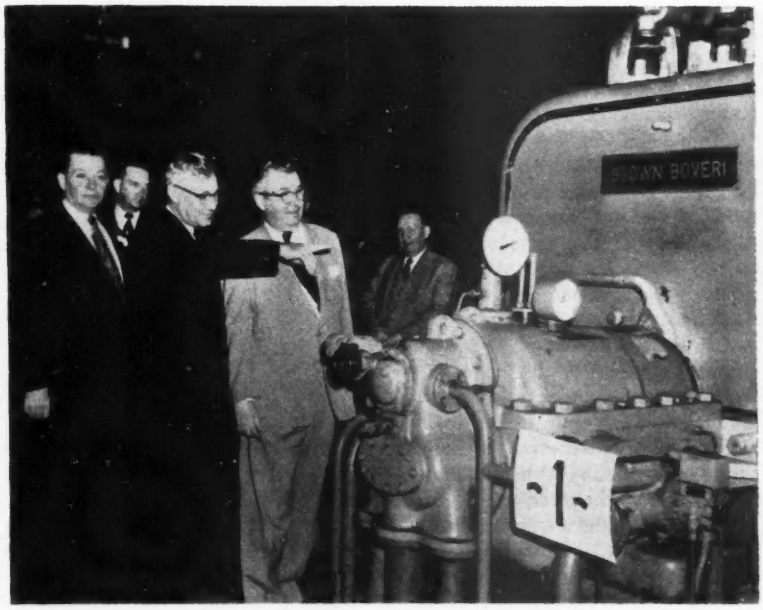
Alabama Power Asks FPC for Permits for 5 Plants

Alabama Power Co is asking for a preliminary permit to build five additional power plants on the Coosa River in Alabama.

If granted by the Federal Power Commission, the permit would give the company priority in applying for a federal license conducting surveys and investigations necessary for the license application.

Sites for the proposed company plants are encompassed in an overall basin development plan already authorized by Congress. The company has indicated that Congressional action will be required to restore licensing jurisdiction to FPC.

The proposed plan calls for the eventual installation of 482,000 hp at the five plants of which 321,000 would be installed initially. One of the developments is to be in the vicinity of Wetumpka, another at the headwaters of Lay Dam in the vicinity of Fort Williams. Third dam would be near Howell Mill Shoals, a fourth near Lock 2, and the remaining one near the Georgia-Alabama state line.



Open House at Cleveland Municipal Plant

The Mayor and Cleveland's Department of Public Utilities held open house at the Lake Road Generating Plant this month in celebration of opening of the latest addition to the Cleveland municipal power plant.

Mayor Thomas A. Burke in his last official function prior to his becoming Ohio's junior senator, cut the ribbon for the official opening and inspection.

The addition of two 25,000-kw turbogenerator sets increases the capacity of the plant 50,000 kw, bringing total nameplate capacity to 137,000 kw.

one of the most comprehensive studies ever made of federal power policy and practices. This is to be the basis for its recommendations on the future government role in this field.

Charles D. Curran, a top library of Congress researcher, is administrator for the group. He directed the staff work for the House Public Works special subcommittee which last year looked into several phases of federal power development (EW, Dec. 22, '52, p 8). Reports issued by this special subcommittee sharply criticized the conflicting accounting methods used in fixing rates on federal power.

No Utility Members . . . Of the 25 other members of the power and water task force, at least 13 have some engineering background and ten are actively engaged in some phase of engineering at present. There are several business leaders, attorneys, accountants along with two publishers and three former state governors on the task force. No member is directly engaged in the electric utility field, but two members formerly were associated with federal or municipal activities relating to power development.

Six of the engineers on the task force were members of the Engineers Joint Council, which a few years ago recommended that federally produced power be marketed at the bus-bar.

Scores Roberts' Record . . . Heading the power generation and distribution subcommittee of the task force is A. B. Roberts, an engineer who has assisted the investigative staff of the House Appropriations Committee. In its pointed statement APPA charges that Roberts is on record as favoring private ownership of power facilities at government multipurpose dams.

Other task force members are:

Charles L. Andrews, Memphis, Tenn., businessman; William B. Bates, Houston, Tex., chairman of the board of Second National Bank of Houston and member of law firm; Pope F. Brock, Atlanta, Ga., general counsel of Coca Cola Co; Carey H. Brown, Scottsville, N. Y., superintendent of engineering and manufacturing services, Kodak Park Works, Eastman Kodak Co.

Charles Edison, West Orange, N. J., former governor, and chairman of the board of Thomas A. Edison Co, Inc. He recently charged that weak state governments had caused an expanding federal government.

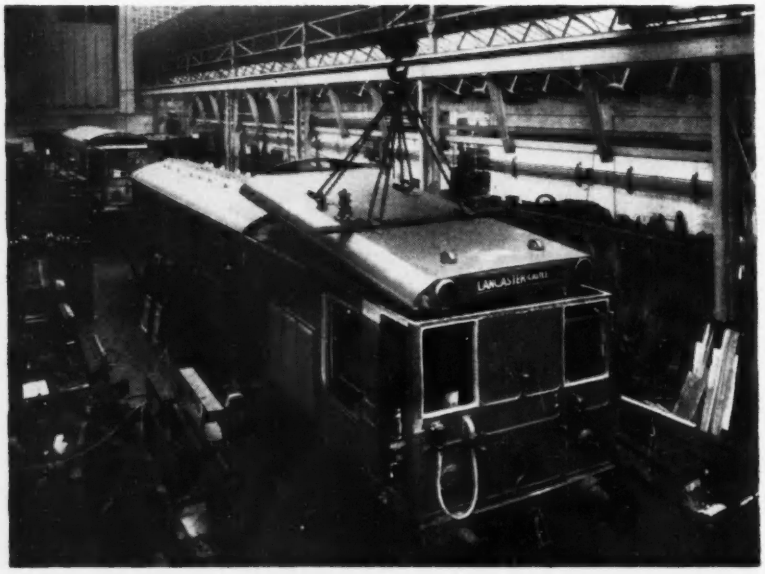
James P. Growdon, Pittsburgh, Pa., engineering consultant for Aluminum Company of America, and several government departments; Julian Hinds, Los Angeles, Calif., general manager and chief engineer of Metropolitan Water District of Southern California; Wesley W. Horner, St. Louis, Mo., consulting engineer; John Jirgal of Chicago, Ill., certified public accountant; E. A. Kracke, Montclair, N. J., certified public accountant, and partner of Haskins and Sells.

J. Bracken Lee, Salt Lake City, governor of Utah and insurance executive; Albert Chester Mattei, San Francisco, Calif., engineer, president of Honolulu Oil Corp; Leslie A. Miller, Cheyenne, Wyo., former governor and member of previous Hoover Commission; Harry Winford Morrison, Boise, Idaho, president and director of several large construction companies; Frank H. Newnam, Jr., Houston, Tex., consulting engineer.

Malcolm Pirnie, New York, N. Y., consulting engineer; Harry E. Polk, Pilliston, N. D., publisher and associated with the National Reclamation Association; Roscoe Pound, Watertown, Mass., former professor of law at Harvard University; John Wallace Reavis, Cleveland, Ohio, attorney.

Donald Randall Richberg, Washington, D. C., attorney, formerly associated with Roosevelt Administration but resigned to become a critic of it.

Robert William Sawyer, Bend, Ore., publisher and former president of the National Reclamation Association; William D. Shannon, Seattle, Wash., consulting engineer, formerly associated with Stone & Webster on Pacific Coast hydroelectric projects; Royce J. Tipton, Denver, Colo., consulting engineer; Lacey V. Murrow, Washington, D. C., American Association of Railroads.

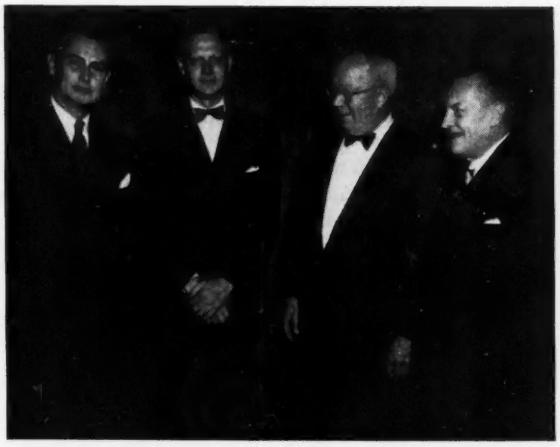


British Railways Try Out 50 Cycles

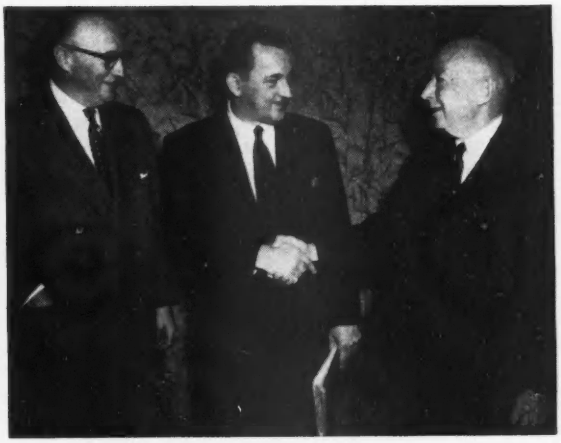
British railways are cooperating with manufacturers in experiments to determine feasibility of using 50-cycle frequency for their railway systems. A 9-mile section of track in the north of England coupling Lancaster with Morecombe and Heysham has been set aside for the experiments.

For 50-cycle traction either transformer-fed, single-phase commutator motors can be used or else phase-and-frequency changers on the locomotive can convert to direct current so that standard traction motors can be used.

Three 3-coach passenger trains like the one above have been equipped for trial runs on regular service. Six-anode rectifiers (with groups of three anodes paralleled for bridge connection) are used to convert 6,600-v ac to dc. the interposing transformer being fitted with taps for speed regulation. Speeds of 75 mph have been achieved with 1.3 mph acceleration. After some months single-anode rectifiers will be tried.



1954 NEMA OFFICERS named at 27th annual meeting include (left to right) President, James H. Jewell, Westinghouse Electric; Vice Presidents, H. P. Steele, Benjamin Electric Manufacturing Co; and F. F. Loock, Allen Bradley Co; and Treasurer, A. F. Metz, Okonite Co



RETIRING NEMA PRESIDENT Lyle Hall, Stackpole Carbon, (right) thanks luncheon speaker Hartley Barclay of New York Times as O. W. Titus, president of Canadian Electric Manufacturing Association and general manager of Canada Wire & Cable, looks on

Newspaperman tells National Electrical Manufacturers Association meeting . . .

Big Electrification Advances Lie Ahead

The era of America's greatest advances in industrial electrification is now opening, Hartley W. Barclay of the New York Times, told more than 300 delegates to the 27th annual meeting of the National Electrical Manufacturers Association at Atlantic City Nov. 9-11.

Speaking before a luncheon meeting of the association, Barclay predicted that progress of electrification in the next five years is likely to exceed the total progress of the last 25 years as pent-up demands for electrical products, created by two wars, are converted into orders.

Expansion Urged . . . Barclay quoted estimates that electrification today is adequate in only 24% of the nation's homes, 21% of manufacturing industry, and 19% of the functions of commerce. He urged a dual campaign of expanded public service for the electrical manufacturing industry, based on spurring home owners to rewire more than 8 million homes and industry to modernize for lower production and maintenance costs.

In the traditional President's Address before the annual business meeting of the association, Nema Pres Lyle G. Hall, Stackpole Carbon Co, said that Nema "never had it so good." He reported membership was 548 as of Nov. 1 and predicted that member companies would account for $4,693,744,000 in total sales this year against $4,173,715,000 in 1952.

However, Hall urged Nema members to become politically minded or the things that have been won by advances in engineering, sales, and production may be lost by the wrong kind of laws.

Better Coordination . . . In a review of 1953 Nema activities, Hall singled out for specific mention the work that has been done with Edison Electric Institute and other associations for better coordination of industry-wide programs. During 1953 the Conference Group on Coordination of Electric Industry Sales was set up and is getting into full stride, he said.

Hall credited the Nema-financed National Adequate Wiring Program for an increased awareness of the need for adequate home wiring. Also mentioned among the highlights of Nema's 1953 activities were the study of foreign trade, underwritten by 131 member companies; activities to strengthen anti-secondary boycott clauses in the Taft-Hartley Act; and the continuing drive to remove the inequities of the present federal excise tax on appliances.

Budget for '54 . . . Nema's $1,154,723 budget for 1954, which differs but slightly from last year's both in content and amount, was adopted without discussion following nominal presentation before the annual business meeting of the association. Largest single project item of the budget again was the Adequate Wiring Program for which $132,835 was earmarked for 1954, compared with $139,709 in '53.

The supplementary budget provided $40,000 to be used by the newly organized National Lighting Bureau of the Industrial and Commercial Lighting Equipment Section. Appointment of Laurance C. Messick as director of the new lighting bureau was announced during the meeting. With this appointment organization of the National Lighting Bureau is complete and its activities will be stepped up. Objective of the bureau is the relighting of the estimated 85% of the commercial and industrial properties whose lighting today is substandard.

James H. Jewell, Westinghouse Electric Corp vice president, was elected president. (See page 39).

THE ELECTRICAL WEEK
CONTINUED

Rural electric cooperatives in 10 Missouri basin states will seek an injunction against Interior Secretary McKay to prevent his department from putting its new federal power marketing criteria into effect Jan. 1. K. neth Holum, member of Missouri Basin Survey Commission, said "unlimited resources of private power companies which are opposing us makes it necessary to pool resources for the fight."

Columbus & Southern Ohio Electric Co has offered 200,000 shares of common on the New York market at $26.25.

IN THE INDUSTRY

"Electrical Modernization." There is a theme all branches of the electrical industry—power producers, manufacturers, distributors, dealers, contractors—could agree on for a big push.

That's why a special conference group named to coordinate industry-wide promotional programs adopted it as the vehicle on which to hang the first joint effort. Having a program like this to develop, they felt, would be an excellent way to get the various associations in the field to work toward integrating all their promotions.

EW Idea . . . The coordination idea, first suggested by Electrical World, is beginning to take shape. It was announced initially by Bayard L. England, then president of Edison Electric Institute, at the EEI Sales Meeting last spring. In October it was outlined to and approved by the board of governors of National Association of Electrical Dealers. Then, at the recent annual convention of National Electrical Manufacturers Association, retiring president Lyle G. Hall picked up the theme:

"Recognizing the competitive era the industry is now approaching in its battle for the consumer dollar, Nema . . . has taken the lead with Edison Electric Institute and other associations to achieve better coordination of industry-wide promotional campaigns among all segments of the industry so that the maximum benefits therefrom can be achieved, especially at the local level. The Conference Group on Coordination of Electrical Industry Sales and Promotional Programs was established this year and is just now getting into full stride. A report on the activities of the conference group has been made to all Nema sections undertaking promotional activities. The channels being made available by the conference group for the dissemination of information on promotional programs of Nema sections to other segments of the electrical industry can be profitably put to use in the future."

EEI and Nema representatives first got together to discuss the plan Jan. 22. Soon afterward, a conference subcommittee proposed that a committee be formed to coordinate the industry's promotion and sales campaigns. This committee, they suggested, initially should be composed of four representatives each from EEI and Nema and two representatives each from National Association of Electrical Distributors, National Association of Electrical Contractors, National Association of Radio-TV and Appliance Dealers, International Association of Electrical Leagues and other interested organizations. To date all have accepted invitations to take part except Narda.

The committee, it was emphasized, should act only as a coordinating group and implementation of its proposals should be carried out through existing channels.

The Why's . . . In considering recommendations it should make to get the program under way, the committee, among other things, had these factors in mind:

- Full industry cooperation can be obtained only through sales activities which are of interest and contribute to the welfare of each segment of the industry.
- Local level support of activities is essential to the overall success of coordinated programs.
- It is timely to encourage coordination of promotional and sales activities within the industry in view of general forecasts of lower business activity in the immediate years ahead.
- The industry should broaden the exchange of information and availability of promotional tools for the benefit of all units.
- There is a real need for a broader base for the coordinated programs. The electrical contractors, distributors and electric leagues especially should be a part of this base.

Against this background, the subcommittee proposed the coordinating group initially should do these things:

1. Set up a program to disseminate information on existing and planned promotional and sales activities.
2. Stimulate further participation of local electrical leagues and associations in national programs and, where leagues are not available, organize local industry committees for this purpose.
3. Selection of a promotional activity which would lend itself to a greater coordination of effort.

That last proposal led to the decision to feature an electrical modernization program. James H. Jewell, new president of Nema and chairman of the subcommittee, pointed out all branches ought to be able to agree on this one, because it presented a large, profitable market.

And that's where the coordination effort stands at the moment. Several industry associations have indicated they want to send men to the coordinating committee, and a couple of others are considering it.

TECHNICAL NOTES
ARCHER E. KNOWLTON

Automatic reclosing circuit breakers outnumber the reclosing fuses 10 to 1 and the manual reclosing circuit breakers 5 to 1 (on some 15,300 three-phase circuits).

Low breakaway torque and relatively low inertia are generally characteristic of condensate, booster and forced circulation pumps and pulverizer exhausters; normal starting torque motors are generally appropriate.

Copper phthalocyanine lubricant is good from −80 to 400 F. The Naval Research Laboratory got 1,000 hours of good operation at 425 F.

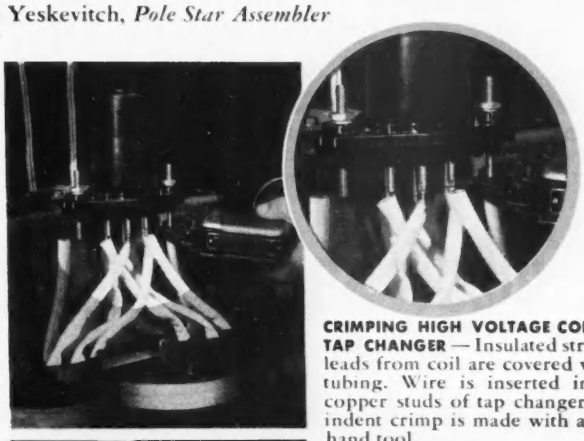
Modern fans for air-cooling power transformers deliver 3,000 to 7,500 cubic feet per minute at velocities higher than 1,000 fpm.

"Crimped Connections are Best....

THAT'S WHY WE USE THEM ON THE POLE STAR"

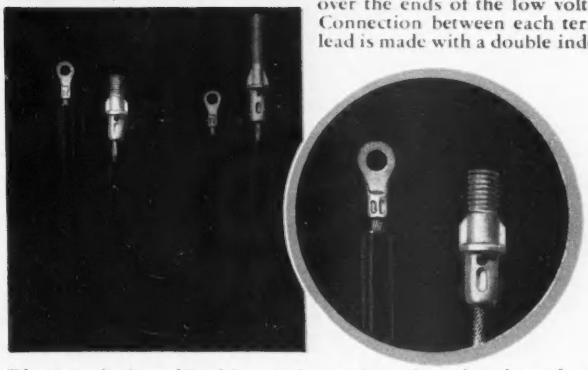
says Joseph Yeskevitch, *Pole Star Assembler*

Pennsylvania engineers believe that crimping makes the finest electrical and mechanical connection. Therefore, wherever possible, connections in the electrical circuit of the Pole Star are made with crimping tools. Neither age nor vibration will deteriorate a crimped connection. Since no heat is applied, no crystallization of the wire can take place to weaken the wire and cause possible breakage. Furthermore, crimping helps eliminate the ever-present element of human error and gives added assurance of the reliability of Pennsylvania Pole Star Distribution Transformers.

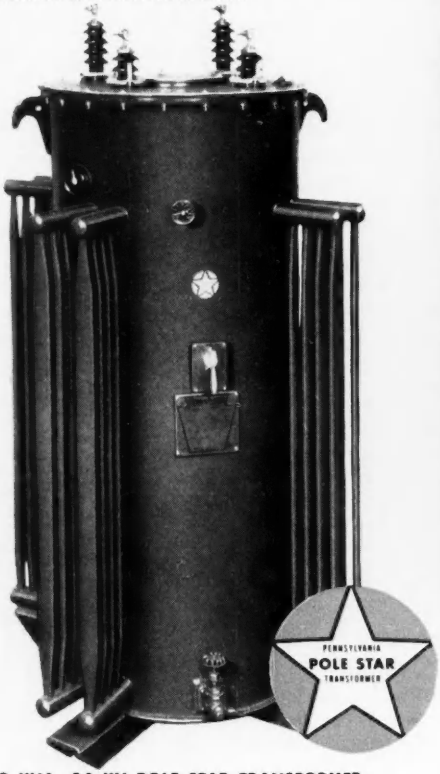


CRIMPING HIGH VOLTAGE COIL LEADS TO TAP CHANGER — Insulated stranded wire leads from coil are covered with plastic tubing. Wire is inserted into hollow copper studs of tap changer. A double indent crimp is made with a pneumatic hand tool.

CRIMPING TERMINALS TO LOW VOLTAGE LEADS — Bushing terminals are placed over the ends of the low voltage leads. Connection between each terminal and lead is made with a double indent crimp.



Ring terminals and bushing studs are also crimped to the ends of each high voltage bushing cable. A double indent crimp is made at the terminal end. A single indent crimp combines bushing stud and cable. The stud is provided with an inspection hole to make certain that the wire is inserted an adequate distance into the terminal.



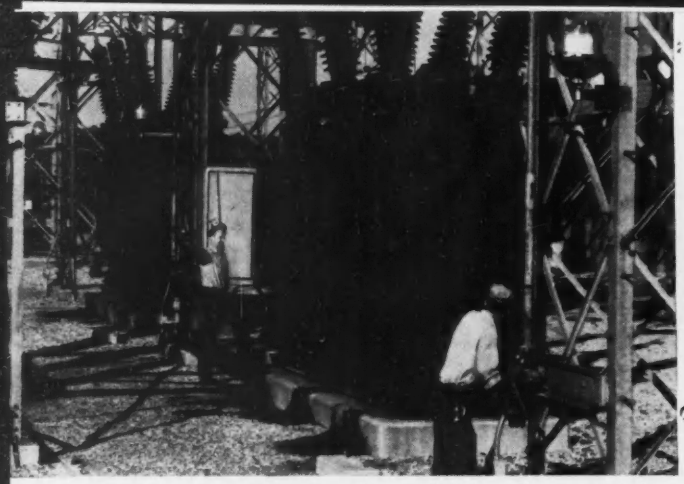
500 KVA, 34 KV POLE STAR TRANSFORMER

Pole Star transformers are available in ratings from 3 Kva through 500 Kva and in voltages from 2400 volts through 43,800 volts.

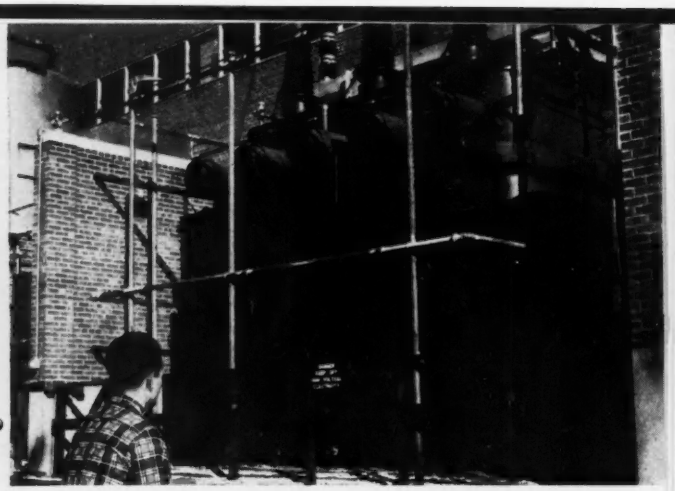
Pennsylvania Transformer Company

A McGraw Electric Company Division

Canonsburg, Pennsylvania • *Greater Pittsburgh District*

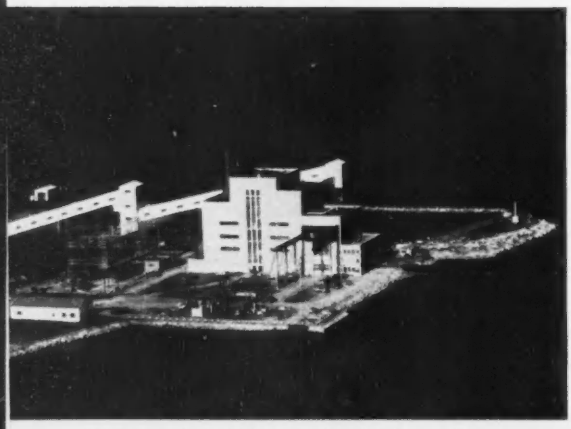


COMPACT SWITCHYARDS can be supplied by G.E., even including yard lighting. Here are two of the three 115 KV-3,500,000 KVA oil circuit breakers at Danskammer Point Steam Station.

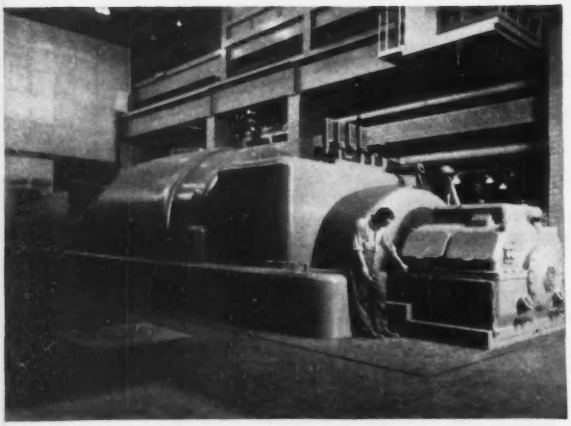


ENGINEERING COORDINATION means simpler installation of major equipment like this 84,000 kva forced-oil-air-cooled transformer. G-E Product Specialists follow selection and installation of equipment.

G-E Project Service Helps Save Manhours,



THIS IS DANSKAMMER POINT Steam Station near Newburgh, N. Y., on the west bank of the Hudson River. G.E. supplied major electrical equipment.



PRESENT 66,000 KW TURBINE-GENERATOR, installed under the supervision of G-E field engineers. Second unit is an exact duplicate of this one.

Engineering coordination, on-time shipments speed construction at Danskammer Point

General Electric Project Service is helping to save time and money for Central Hudson Gas & Electric on their expansion at the Danskammer Point Steam Station. Working closely with Central Hudson and Burns & Roe (engineers and constructors) a General Electric Project Team follows every phase of engineering, manufacturing, and delivery of substantially all the major electrical equipment to be used in the 66,000 kw addition to be completed early in 1954.

A Project Team captained by the G-E sales engineer and consisting of an application engineer, expeditor, and system and product specialists was also following the first unit, built in 1951, to keep delivery, and thus construction, on schedule—reducing the need for costly overtime and conserving engineering talent.

HERE'S HOW YOU BENEFIT FROM PROJECT SERVICE

Whenever you have a building or expansion program involving major pieces of equipment, Project Service can help you and your consulting engineer. A Project Team will:

SIMPLIFY ORDERING OF EQUIPMENT, either purchased directly or through your consulting engineers or machinery manufacturer.

CONSERVE YOUR ENGINEERING TIME by handling many important electrical details, relieving you and your consulting engineer.

COORDINATE EQUIPMENT DESIGN to insure maximum utilization of equipment, throughout the entire project.

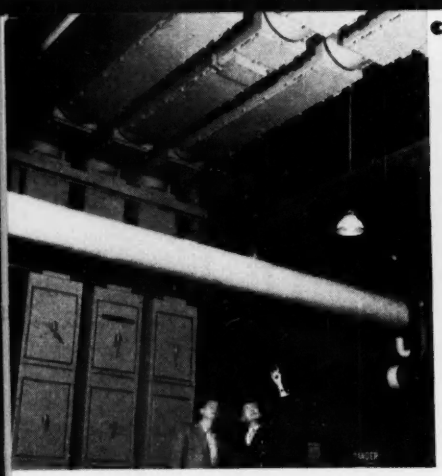
SPEED CONSTRUCTION by insuring the arrival of equipment exactly as it is needed for greatest efficiency.

SUPERVISE INSTALLATION to insure minimum start-up time and help train operators.

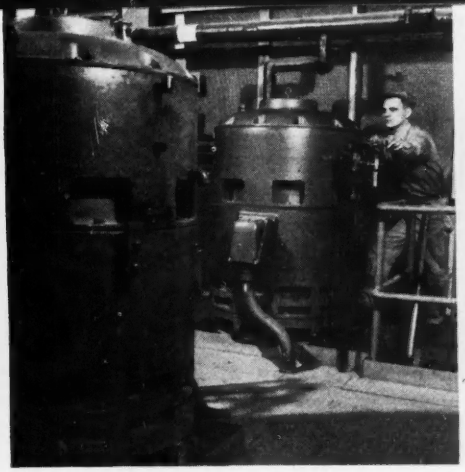
For details on how Project Service can help you, contact your G-E Representative or write for GEA-6032, to Apparatus Sales Div., General Electric Co., Schenectady 5, N. Y. 302-3

MORE POWER TO AMERICA

GENERAL ELECTRIC



G-E 3600 AMP ISOLATED PHASE BUS and surge protective equipment, well planned in the early stages, goes in fast.



PROJECT SERVICE INSURES complete electrical coordination of station auxiliary equipment, such as these 125 hp circulating water pump motors.

PACKAGED CONTROL CENTERS, such as this, simplify operation, compactly combine related elements.

Cut Costs for Central Hudson Gas & Electric

PROJECT PROGRESS on second unit is discussed by C. B. Wilson, G-E Application Eng., Ralph Roe, Pres., Burns & Roe, Engineers and Constructors, W. West, G-E Sales Eng., and R. B. MacGuinness, V. P. of Central Hudson

DELTA-STAR'S *New* "QB"

INTERRUPTING DEVICE FOR ALL AIR SWITCHES

VERTICAL, HORIZONTAL, HOOK STICK

for opening line charging currents, transformer magnetizing currents and small load currents at voltages from 15 KV to 161 KV.

Easily Installed on Switches Now in Service

Necessary phase spacings and clearances are not increased by the addition of the "QB" Device. The current path through a closed switch is through its main blade and contacts. The quick break blade is not in the current path until the switch starts to open; then the current is transferred from the main switch contact to the quick break blade.

Simple, Positive—No Additional Effort Required in Opening Switches When Frozen

The quick break blade is carried without extra effort. Ice on the main switch blade and contact is broken before effort is expended in breaking the ice on the "QB" attachment.

Spring and Current Carrying Members are Independent

Spring actuated quick break blade is mounted on the switch contact stack. This design permits the use of a more substantial construction, a heavy independent spring driving mechanism and much greater opening speeds.

"QB" Quick Break Device applied to a MK-40 Vertical Break Switch.

Fig. 1—Vertical Switch blade (A) is closed into the main contact (B) and the quick break blade (C) is in neutral position.

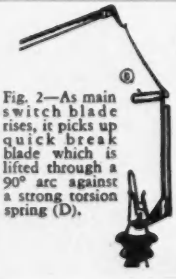


Fig. 2—As main switch blade rises, it picks up quick break blade which is lifted through a 90° arc against a strong torsion spring (D).

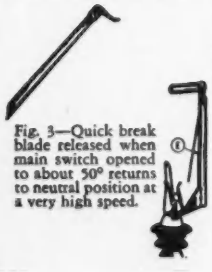


Fig. 3—Quick break blade released when main switch opened to about 50° returns to neutral position at a very high speed.

WHEN YOU WANT THE BEST IN HIGH VOLTAGE EQUIPMENT SPECIFY DELTA-STAR

DELTA-STAR ELECTRIC DIVISION

H. K. PORTER COMPANY, INC.
OF PITTSBURGH
2437 FULTON STREET, CHICAGO 12, ILLINOIS
DISTRICT OFFICES IN PRINCIPAL CITIES

WISCONSIN UTILITIES ASSOCIATION honored Morton O. Withey, center, dean emeritus of College of Engineering, Wisconsin University, for outstanding service. G. W. Van Derzee, Wisconsin Electric Power, presented citation. At left is George Donald, association head

Make Reactors Competitive . . .

. . . urges Detroit Edison's Walker Cisler at sales and technical meeting of Wisconsin Utilities Association

"We must make atomic energy competitive with conventional fuels if we are to have widespread use of it," Walker L. Cisler, president, Detroit Edison Co, told the sales and technical sections of the Wisconsin Utilities Association at their annual meeting in Milwaukee Nov. 12.

Cisler said that according to presently available figures there is 23 times as much atomic fuel as conventional fuels in the world. However, he said, if 23 times as much result is to be realized from it, it must be used efficiently and not be wasted. But any reactor that makes use only of the U-235 portion of the energy is using only 7/10% of that available and under those conditions the available supply will not go 23 times as far as the available supply of other fuels, Cisler pointed out. He said the answer is the breeder reactor which will use atomic fuels more efficiently.

Immediacy of the problems of atomic power is indicated by the fact that Atomic Energy Commission hopes to have its 60,000-kw plant in operation within three or four years, George P. Steinmetz, commissioner, Wisconsin Public Service Commission, pointed out. Electric utilities in Wisconsin should prepare for that time, he said.

Return on investment of electric utilities is on a downward trend, Edwin Vennard, president, Middle West Service Co, told the group. He said the more they sell, the less they make. Solution to the problem, Vennard declared, is a revision of the rate schedule, with increases where necessary, particularly in the bottom step, and a planned sales program will improve the load factor.

Piecemeal Socialism . . . Advocates of piecemeal socialism and many of their political cronies who were sidetracked by the people in the 1952 election again are actively attempting to mislead the public, George A. Donald, Wisconsin Utilities Association president, told the convention. Members of the industry, he said, cannot afford to let untruthful statements create false impressions which may result in erroneous public conclusions. People of the industry should express themselves whenever and wherever they can, said Donald.

Technical Section . . . The fully supercharged generator permits large savings in power plant costs L. T. Rosenberg, Allis-Chalmers Manufacturing Co, told the meeting. Generator size is greatly reduced, hydrogen requirements are much less, the power plant size and the crane span and capacity can be reduced, and larger units can be shipped assembled, he said.

In choosing the type of boiler feedwater treatment, demineralization versus evaporation, economic studies should be made, said M. C. McKeown, Cochrane Corp. He said evaporators are generally favored when the fuel cost is low and solids content is high. However, he added, the trend is toward demineralization and this method is used when engineers want to eliminate the problems of the evaporator and get maximum flexibility.

Electromagnetic scale model transformers, with characteristics very close to those of a full scale transformer, have been used effectively in development of designs of large transformers, Lynn Wetherill, General Electric Co, reported. Advantage of the model is that data can be obtained faster and at lower costs, he said.

Electrical stresses in high or low voltage potheads are simply a function of electrode shapes, sizes, configuration and the various dielectric mediums separating the electrodes, said J. H. Nicholas, G&W Electric Speciality Co. Therefore, he said, the basic fundamentals of low voltage design can be directly applied to high voltage designs.

Use of induction generators, semi-outdoor design of plants, simple relay and water wheel controls and fully automatic features have materially reduced investment, operating and maintenance costs of small hydro plants, it was reported in a joint paper by H. H. Brown, Wisconsin Michigan Power Co, and A. R. Klann, Allis-Chalmers.

Sales Section . . . More sales have resulted from a continuing survey of appliances in homes said A. G. Blitz, Wisconsin Public Service Corp. He said machine accounting cards make this possible and very simple. The survey is to be on an 18-month cycle.

Lighting recipes have been taken to 6,000 people by a two-man team in a period of six to seven months, said John Burke, Jr, Wisconsin Power & Light Co. Demonstration equipment is loaded into a 4 ft x 7 ft, low body, two-wheel trailer, with overflow in the car trunk and rear seat.

Ideals for which the company strives throughout the entire organization are courtesy to the public, the best possible service to its customers, and safety to all its employees and the public. This goal can be reached only by loyalty, intelligent cooperation, and a thorough understanding and practice of safety measures by every employee.

Remember that this company is judged by the attitude and conduct of its individual employees. Since our company is a public-service corpotation, and therefore a public servant, it is your duty as an employee to serve the public courteously, efficiently, and with safety to yourself, your fellow worker, and the public.

The safety policy of this company includes the following objectives: (1) To integrate completely safety with production and operation, (2) to provide safe working conditions, proper and adequate tools, equipment, and protective devices, (3) to see that employees are at all times kept familiar with the general and special practices for the safe conduct of their work, and (4) to see that those safety measures and recommendations which apply are in all cases carried out by the employees.

Vice President and General Manager

This Policy . . .

This safety manual is for Your guidance in the prevention of accidents to Yourself, your fellow employees, and the public, and to show some approved First-Aid methods to use when accidents occur. This manual is the result of many years' experience and represents the thoughts of qualified employees.

For quick reference, the Safety Instructions are divided into eight parts: (1) GENERAL (applicable to all situations), (2) ELECTRICAL OPERATIONS, (3) TRANSPORTATION, (4) CONSTRUCTION, (5) OFFICE, (6) FIRST AID, (7) RESUSCITATION, and (8) DATA. Index and cross references employ first letter of Section (G, E, T, etc.) and paragraph number, (for example, G-1, E-5, etc.) for identification of parts.

This manual contains many rules and safe practices that have been accepted as standards by various departments; yet, it cannot cover all conditions which may arise on the job. Omission of any safe practice herein does not reduce individual responsibility for alertness and good judgment in the performance of work.

Where any instruction contained in this manual conflicts with national, state, or local laws, codes, or regulations, such laws or regulations shall be followed instead of the instructions in this manual.

With this Purpose . . .

Helped to Develop . . .

An Effective Safety Manual for AG&E System

ALLEN M. PERRY, Public Relations Dept, American Gas & Electric Service Corp, New York 8, N. Y.

People will apply ideas that they help develop. Human beings resent ideas that are forced on them even when they are for their own benefit.

These basic principles guided the development of a new safety manual prepared by and for the sister operating companies in the seven-state American Gas & Electric System under the supervision of the American Gas & Electric Service Corp.

Safety not Assured by Any One Activity . . . Before explaining the procedure of developing this manual, it should be emphasized that safety is not assured by any one activity. It is the policy of all AG&E companies to make safety an integral part of all their operations. They provide safe construction and working conditions, formulate safe operating methods, provide safe tools and equipment with which to work. Foreman responsibility for the safety of the men is the keystone of accident prevention methods.

To guide and coordinate all safety practices, each operating company has its own safety director and safety

supervisors in each division, district, and station. The periodic conferences of foremen and superintendents always include discussions of practices from the viewpoint of safety. Foremen, in turn, train their men in safe practice. Training courses prepare new men to do their work safely. Accident records and even near-accidents are analyzed to prevent future accidents.

The record is good, compared with national statistics for the electric industry, but each is trying each year to obtain as near a perfect record as possible. All operating company safety directors periodically meet with the AG&E director of safety who guides and coordinates their activities.

The manual is only part of the safety program and supplements it by presenting the fundamental and specific requirements to each employee in readily usable form.

The previous safety manual served fairly well for nearly 20 years by reprinting it occasionally with modifications called for by changes in the power industry and continuing enlightenment on practices. But the old form and arrangement did not readily adapt it to quick reference or periodic changes.

New Approach . . . A new approach to obtain an effective manual was adopted recently to conform with the basic principles stated in the first paragraph. Primarily, the objective was to collect and coordinate safety ideas from the men who are working in the field so that the final safety manual would embody ideas that they will gladly apply because they consider them reasonable and practicable.

Each company's safety director corralled safety ideas from men in construction, operating, and transportation departments by enlisting the cooperation of foremen, supervisors, and department heads. All except power-plant ideas were collected because it was considered that a specialized section of the manual could be developed for power stations more readily after the effectiveness of the present safety manual is demonstrated.

At a field conference of all safety directors these ideas were submitted and discussed.

Section Divisions Preferred . . . The conference-group opinion was that the safety instructions and recommendations should be divided into sections covering general requirements to all situations, and specialized sections on electrical operations, transportation, construction, office-work, first-aid, and resuscitation. Widely helpful data in the form of charts and tables applicable to every-day work were appended to increase the value of having the manual available at all times.

One safety director undertook to consolidate the ideas into a rough draft of the proposed manual. In doing so, the compiler naturally encountered differences of opinion but also found unity of objective. He did his best to reconcile detailed expressions of the ways to achieve the objective.

This rough draft was submitted to both the AG&E electrical engineer, and the director of safety and employee relations for consideration as the basis of a safety manual which would be acceptable to workers in the field.

To expedite production and circulation of the final manual, that job was turned over to the author for conversion into concise, readily assimilatable form, and an arrangement that would facilitate quick reference.

ACCIDENTS DON'T HAPPEN

G-18 — Accidents do not "Just Happen" — Accidents are the result of unsafe acts, unsafe conditions, or a combination of both.

G-19 — Unsafe conditions which may result in accidents include the following:

a. Unguarded: Unshielded moving parts of machines, saws, etc; unbarricaded floor openings and excavations; unenclosed high voltage equipment; unisolated live circuits; and equipment lacking rubber protective equipment or barriers, etc.

b. Inadequately guarded: Insufficient warning signs, inadequate guards for the job, makeshift barriers, etc.

c. Defective material or equipment such as mushroomed chisels, split handles, rotted or broken poles, poorly constructed or weak equipment.

d. Hazardous arrangements due to poor housekeeping, unsafe planning, inadequate working space.

e. Unsafe clothing such as neckties or jewelry when worn near machinery, and failure to use goggles, proper shoes, respirator, rubber gloves or sleeves.

f. Improper illumination such as insufficient light, or unsuitable location producing glare or objectionable shadows.

g. Unsafe design and construction.

h. Improper ventilation such as insufficient change of air or presence of harmful vapor, dust, or gas.

G-20 — Unsafe acts which may cause accidents include the following:

a. Operating without authority or warning such as closing switches without authority, operating hoists and trucks without warning, failure to place warning signs or signal man where needed, failure to block or guard equipment against unexpected movement.

b. Operating or working at unsafe speed such as driving too fast, throwing material or tools to another worker, jumping from vehicles or platforms.

c. Making safety devices inoperative such as removing guards from machines, using fuses, blocking safety valves.

d. Using unsafe equipment or using equipment improperly such as using dull cutting tools or mushroom-head chisels, pipe extensions on wrenches not designed for them, wrong tool for the job, or using hands instead of hand tools.

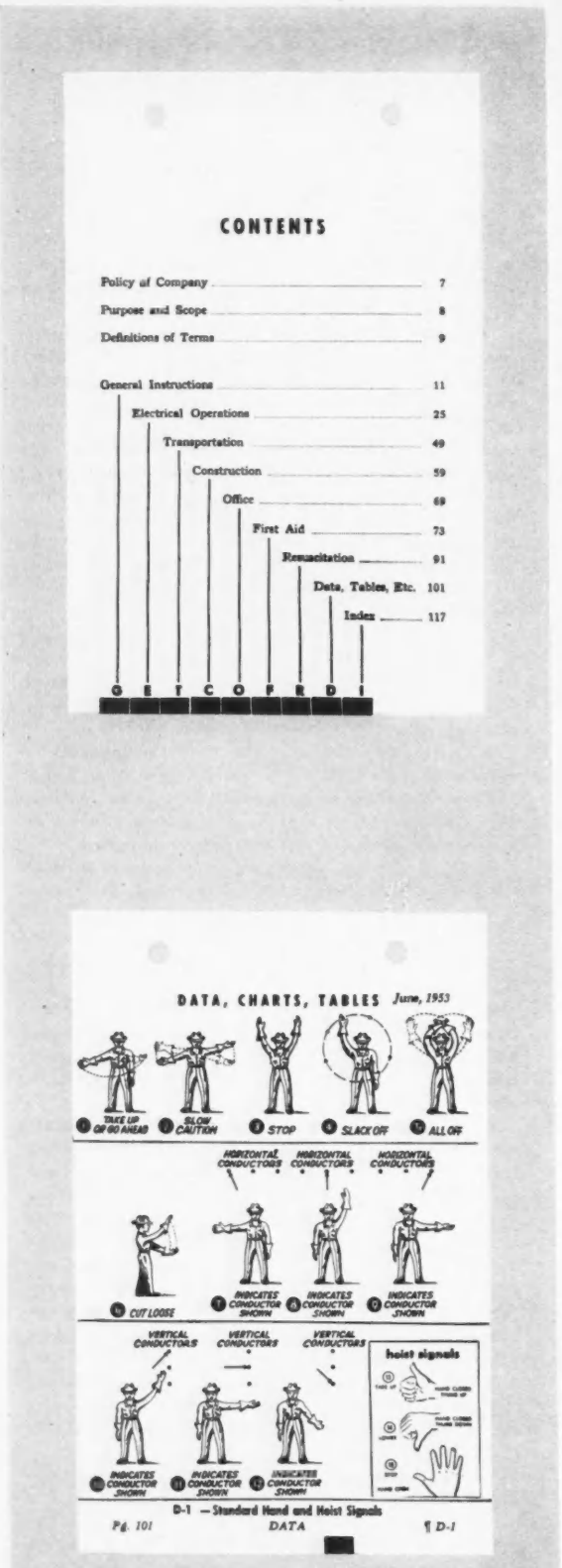
e. Unsafe loading, placing or mixing such as overloading cranes and winches, carrying too heavy a load, leaving objects where they are likely to fall, improper packing, combining chemicals to form a dangerous mixture.

f. Taking unsafe position or posture such as working on live conductors from above instead of below, walking under suspended loads or too close to openings, lifting while in awkward position, entering areas where there are dangerous gases or fumes, passing on curves or hills, riding on running boards, etc.

g. Working on dangerous equipment such as cleaning, oiling, or adjusting moving machinery, and working on live electrical equipment that could conveniently be de-energized.

h. Distracting, teasing, startling such as practical joking, horseplay, quarreling, or annoying.

i. Failure to use safe clothing or protective equipment such as wearing loose sleeves; neckties or jewelry near moving machinery, failure to use rubber gloves or sleeves around energized equipment, and failure to use goggles, helmet, gas mask, respirator, etc.



SAMPLE PAGES show clarity of new manual

The sample page illustrated shows the rather novel contents page providing a thumb index without the expense of dictionary-type thumb tabs. It shows a sample page with all paragraphs identified by the initial letter of each section and sequential numbering, and each page marginally labelled with date, page number, section, paragraph numbers, and thumb-tab corresponding to that on the "Contents" page.

Because of this arrangement, the cross-referenced index refers only to numbers of paragraphs which are easily found and more specific references than just page numbers.

Reconciling Viewpoints . . . Sufficient mimeographed copies of the tentative manual were sent to each operating company's safety director so he could distribute them among his company's foremen, supervisors, and department heads for suggested changes, and also to each company's general manager for policy consideration. Each company safety director had the responsibility of collecting and coordinating changes suggested by his company's men, and submitting the consolidated opinions to the AG&E director of safety and employee relations.

To reconcile natural differences of opinion, a conference of all company safety directors was called. It was attended by the AG&E executive in charge of operations, the director of labor relations, director of insurance, electrical engineer, his specialist on safety, the director of safety and employee relations, his assistant, and the author.

At this all-inclusive conference, any differences of opinion were discussed and revisions made. Majority opinion of operating-company safety directors largely determined which instructions should be mandatory rules and which should be merely recommendations.

While requests were made during preliminary discussions that the manual be made in loose-leaf form to permit later inclusion of the section on power stations, allow future changes without reprinting the entire manual, and permit inclusion of just those sections which applied to each job, the loose-leaf idea raised considerable discussion.

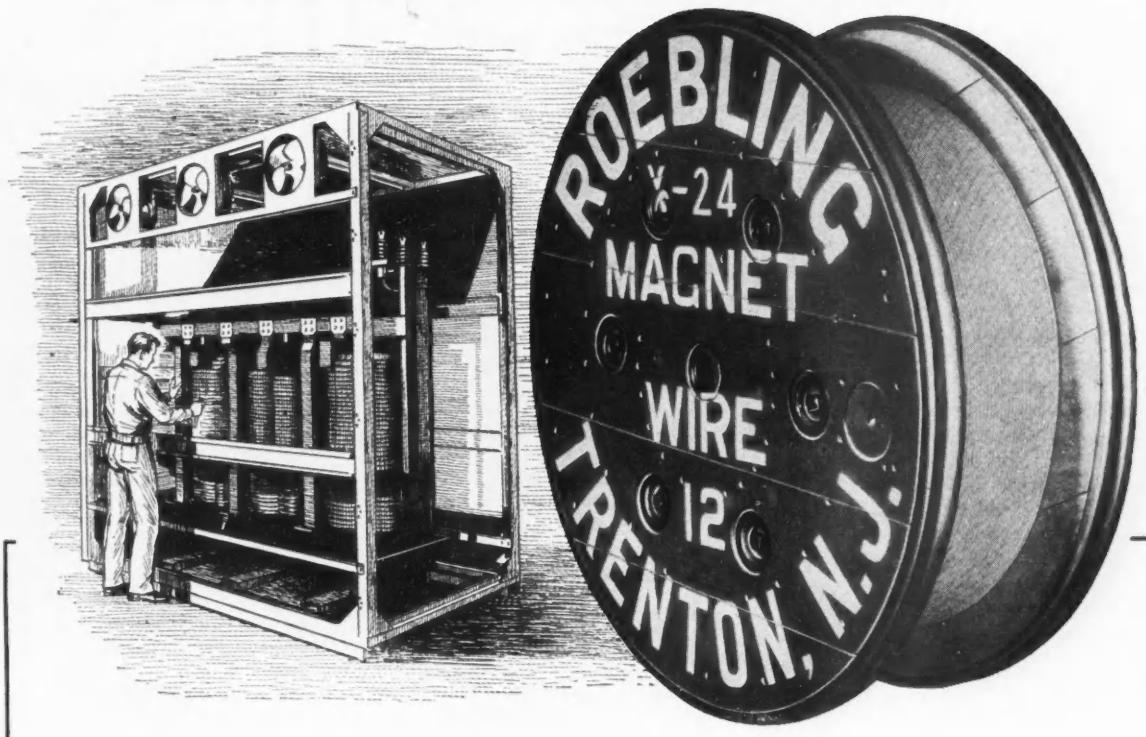
For example, 23,000 loose-leaf binders and initial assembly of contents are usually much more expensive than saddle-stitched books. There is always the question whether revised pages will be inserted promptly or left for later insertion and then forgotten. Some recipients may be inclined to use loose-leaf binders for personal needs thus defeating their original purpose.

However, after consulting a printer who recommended a simple, durable grease-resistant binder composed of separate front and back covers joined by screw posts, the 5″ x 7½″ loose-leaf manual was recommended to general managers of the operating companies because of advantages cited. In the quantity needed the cost was estimated to be about 50¢ per copy including all expenses except the time of persons involved in preparation of its contents. That cost was about twice that for a saddle-stitched book.

Before printing the Safety Manual, the tentative manual was revised in accordance with decisions of the all-inclusive conference and submitted in mimeograph form to the operating companies' general managers and their safety directors for final approval or last corrections. Because of the cooperative procedure from the start customary expensive last-minute changes in type-set material were avoided, and actual production cost came very close to estimated cost.

Now...a new high temperature magnet wire...

ROEBLING ROETEMP



ROETEMP MAGNET WIRE brings you a brand new and superior type of insulation for applications that involve high operating temperatures. Its heat-resistant properties and dielectric strength, its extra toughness and working ease make this new Roebling ROETEMP your top choice for Class B, dry-type transformer windings, and for other electro-magnetic devices designed for operation with hot spot temperatures of 130°C (266°F).

Roebling ROETEMP Magnet Wire is insulated with a specially processed tape applied in a single wrap with a liberal overlap. It is exceptionally pliable and bends without cracking or separating from the conductor. It won't unravel; is ideal for higher speed winding; comes in a range of sizes from #1 to #12 AWG, round, square and rectangular.

Write for full data on Roebling ROETEMP Magnet Wire...and Roebling silicone bonded ROEGLAS wires for special temperature problems. John A. Roebling's Sons Corp., Trenton 2, N. J.

A subsidiary of The Colorado Fuel and Iron Corporation

ROEBLING

ATLANTA, 934 AVON AVE • BOSTON, 51 SLEEPER ST & 5 PITTSBURGH ST • CHICAGO, 5525 W. ROOSEVELT RD • CINCINNATI, 3253 FREDONIA AVE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST • DETROIT, 915 FISHER BLDG • HOUSTON, 6216 NAVIGATION BLVD • LOS ANGELES, 5340 E. HARBOR ST • NEW YORK, 19 RECTOR ST • ODESSA, TEXAS, 1920 E. 2ND ST • PHILADELPHIA, 230 VINE ST • ROCHESTER, 1 FLINT ST. • SAN FRANCISCO, 1740 17TH ST • SEATTLE, 900 1ST AVE S. • ST. LOUIS, 3001 DELMAR BLVD • TULSA, 321 N. CHEYENNE ST • EXPORT SALES OFFICE, TRENTON 2, NEW JERSEY

Why L-M Round-Wound Transformers Have Such High Short-Circuit Strength

by **JAMES G. EVERHART**
Chief Engineer
Transformer Division
Line Material Company

One of the desirable characteristics of L-M Round-Wound transformers is their exceptionally high short-circuit strength. Partly this is inherent in the way we wind round coils on a wound core. But further, this strength arises from the exceptionally good mechanical design.

Effects of Short Circuits

Short circuits exert two forces—radial and axial. Under radial forces, rectangular coils tend to assume a round shape. Being already round, the coils on Round-Wound transformers resist these radial forces much better than do rectangular coils. (Figs. 1 and 2).

Axial forces tend to telescope the windings. Although failure is progressive, it can occur almost instantaneously. If the coil starts to telescope, the electrical centers of the coils are abnormally displaced. This results in a greater axial component which increases the force and the movement, leading to complete failure. (Figs. 3 and 4).

In larger transformers the mechanical forces involved can amount to thousands of pounds. Therefore in Round-Wound transformers we pay special attention to providing a mechanical structure sufficiently strong to support and hold the coils in position in the assembly.

This structure requires a rigid steel frame, firmly tied together vertically (Fig. 5), and properly designed blocking (Fig. 6). Even leads must be strongly clamped (Fig. 7), since great mechanical forces may exist between adjacent leads.

Varnish Selection

Correct application of the proper varnish provides a bond between layers of insulating paper and coil sections which contributes to short-circuit strength. We have developed a variety of tests for varnish, including a mechanical test of bonding strength. (Fig. 8). These tests enable us to select those few varnishes which combine the highest mechanical and electrical strength with other desirable qualifications.

The overall result of design, construction, selection of materials, and careful manufacture has given L-M Round-Wounds unusually high short-circuit strength, which contributes to an extremely low rate of failure.

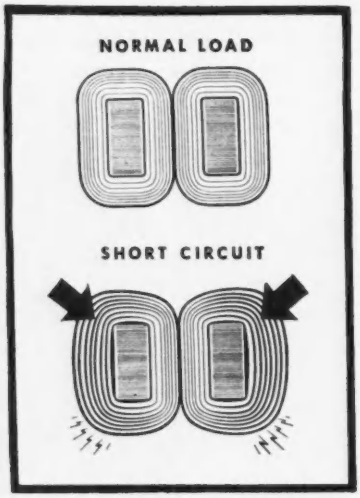


FIG. 1. Radial forces existing under short-circuit currents make rectangular coils tend to become round. The forces may be violent enough to damage insulation, or may completely destroy the coils.

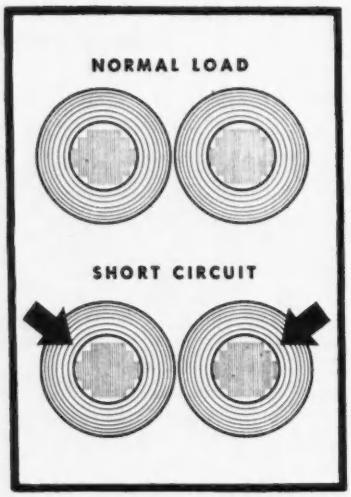


FIG. 2. Since the coils of Round-Wound transformers are already round, short-circuit radial forces cause no distortion. Thus Round-Wounds have inherently higher short-circuit strength.

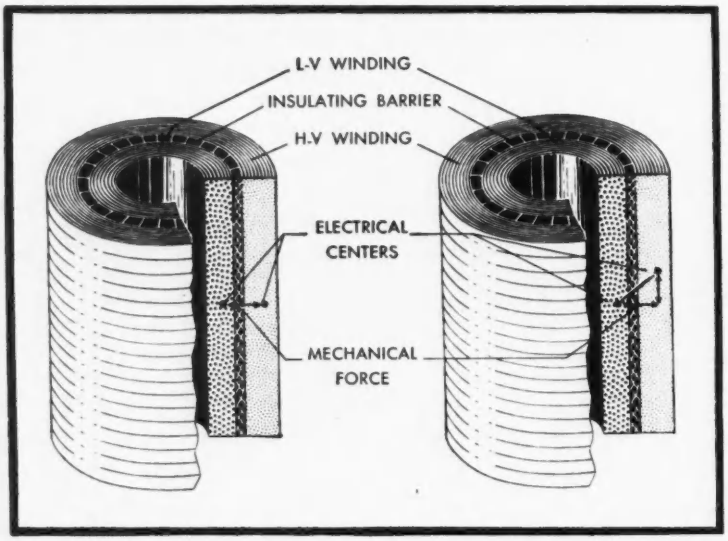


FIG. 3. Diagrammatic vertical section of coil showing primary and secondary electrical centers on the same horizontal plane. Under short circuits, all forces are radial and windings tend to repel each other in a horizontal plane. But even though coils can be designed with the electrical centers on the same plane, manufacturing tolerances cause some variations; and tap changer operations will cause some unbalance.

FIG. 4. With electrical centers displaced vertically, the force between the centers has both radial and axial (vertical) components. Axial forces cause the windings to telescope and separate vertically. Any displacement increases the vertical force component between them, which progressively compounds to complete destruction of the coils. The rigid construction of Round-Wound transformers prevents the slightest movement.

LINE MATERIAL Transformers

Compare the Things That Count

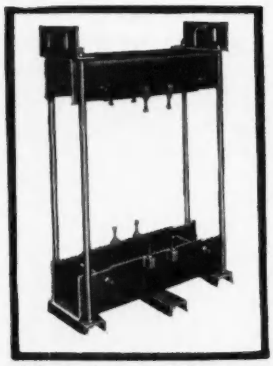


FIG. 5. Heavy steel frame provides a rugged mechanical structure that is firmly tied together vertically. It is sufficiently strong to support and hold coils in position in the assembly.

FIG. 6. Sturdy kiln-dried, oil-impregnated, shaped maple blocks give maximum contact and support to coil-edge surfaces. These are assembled and clamped so that they cannot move out of position under short-circuit forces.

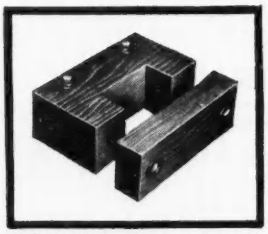


FIG. 7. Under short-circuit conditions, great mechanical forces exist between adjacent leads—especially in large transformers. These leads are strongly clamped so they cannot be harmfully displaced.

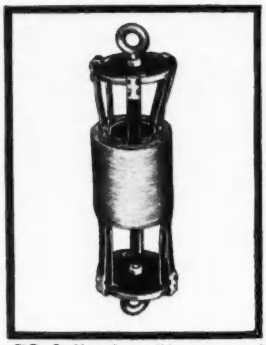


FIG. 8. Here is a coil impregnated with a test varnish set up for a pull test—which will determine whether the varnish has adequate bonding strength. This is just one of the tests L-M has developed to select the best varnishes for Round-Wound transformers.

"Round-Wound" is a Line Material Company trademark

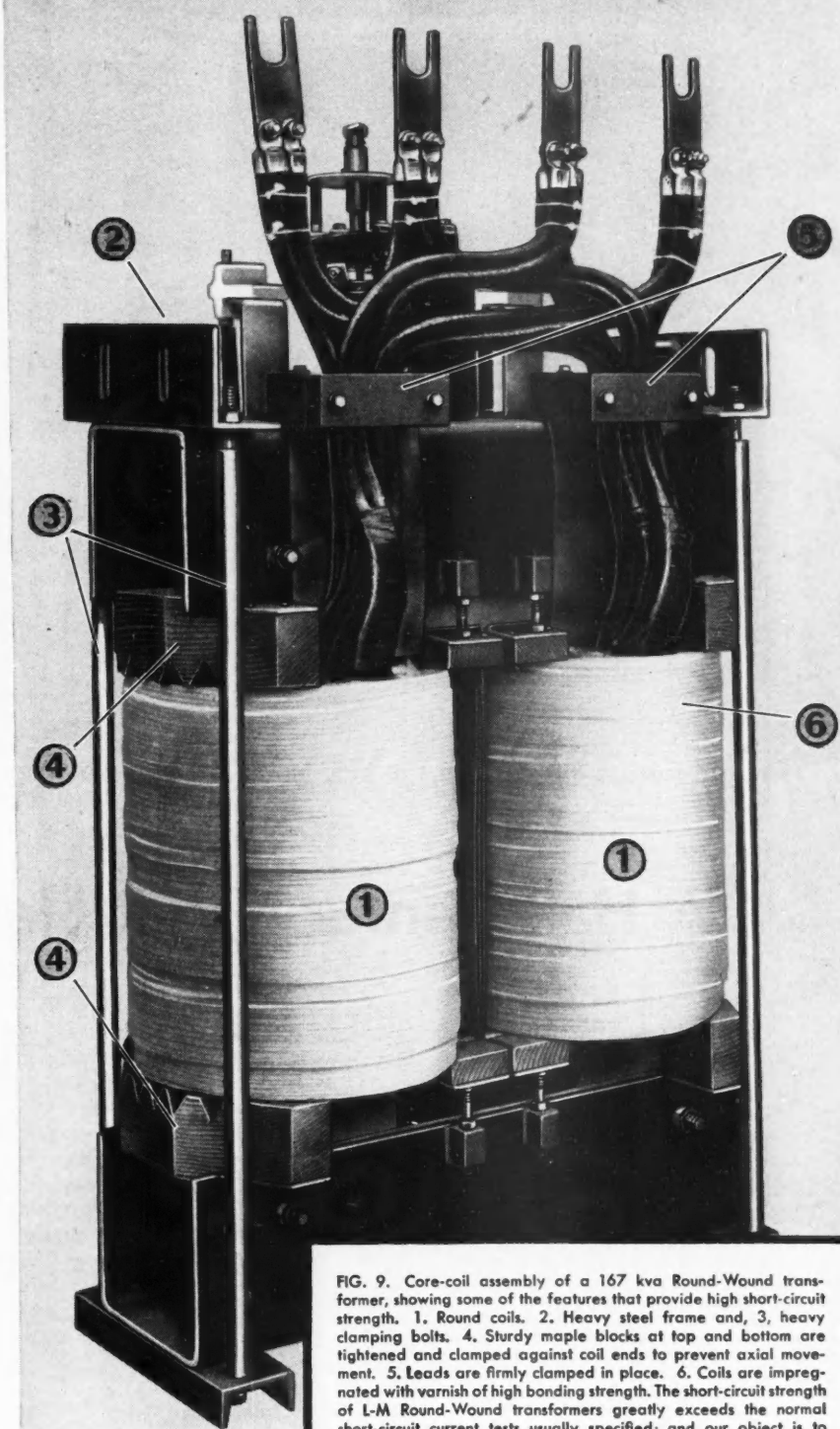
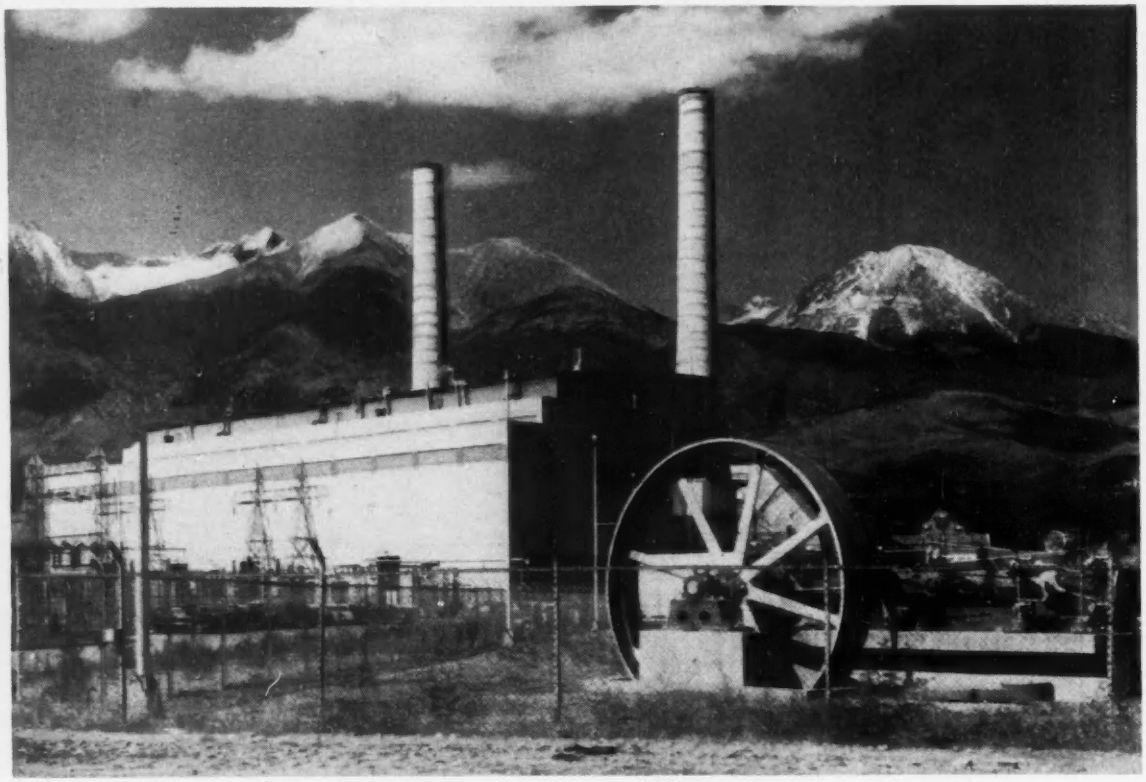


FIG. 9. Core-coil assembly of a 167 kva Round-Wound transformer, showing some of the features that provide high short-circuit strength. 1. Round coils. 2. Heavy steel frame and, 3, heavy clamping bolts. 4. Sturdy maple blocks at top and bottom are tightened and clamped against coil ends to prevent axial movement. 5. Leads are firmly clamped in place. 6. Coils are impregnated with varnish of high bonding strength. The short-circuit strength of L-M Round-Wound transformers greatly exceeds the normal short-circuit current tests usually specified; and our object is to build transformers that will withstand *dead* short-circuit currents.

Get Complete Information About L-M Round-Wound Transformers

We'd appreciate an opportunity to give you full information about the many desirable characteristics of these outstanding transformers. We'd like you to compare them with others—"Compare the things that count!" Ask the L-M Field Engineer for information; or write for new Bulletin DT-1 to Line Material Co., Transformer Div., Zanesville, Ohio (a McGraw Electric Company Division).



The old Corliss engine and the new power plant symbolize . . .

A Half Century That Electrified the

Tom Edison used to say he got the idea for perfecting his electric light in the Rockies. While fishing at Rawlings, Wyo., he began stripping pliable strands of bamboo from his fishing rod. And then it hit him—the idea to use a tough, thread-like filament in the incandescent lamp.

The subsequent success of the experiment and its development for commercial use were quickly followed up in the area where Edison's idea took shape. One of the West's first commercial electric plants was built at Cheyenne, Wyo., in 1882 by Sen Francis E. Warren. He peddled energy to his customers in the form of large storage batteries. Next year Denver adopted electric lights for street illumination. Eight 150-ft towers beamed light over large areas of downtown and nearby residential sections. After that, the electrical industry boomed

By 1902 there was so much business that a group of men in the field decided to form an organization to further their interests. That organization, Colorado, Electric Light, Power & Railway Association, was the progenitor of today's Rocky Mountain Electric League. The league pointed up the fact this fall by staging a 50th Annual Convention as a carry over from the meetings of the first association and several successors.

Four-State Outfit

Expanding from what originally was a Denver organization and then a state-wide group, RMEL now embraces all of Colorado, Wyoming, New Mexico and South Dakota. It numbers among its members 21 utilities, 41 manufacturers, 23 distributors, 22 contractors, 17 dealers and 15 associate members. It is just about the best-rounded electrical group in the country.

Several annual events feature the League's work. In March and electric meter institute is held at the University of Denver. Sessions there demonstrate the manufacture, installation and repair of meters. At the spring conference, committees on engineering, accounting, sales promotion, adequate wiring, and television explore recent developments in their respective fields.

RMEL's fall convention is a three-day affair with speakers from many sections of the country representing all phases of the electrical industry. At this year's convention, M. M. Koch was elected president.

Topping the year for the League is the Christmas lighting contest, in which scores of towns in its area participate.

The man who gives continuity to

From John F. Vail . . .

. . . to Guy W. Faller . . .

. . . to M. M. Koch and Ralph Hubbard—50 years of the RMEL line

Rocky Mountain Area

the League's functions is Ralph B. Hubbard, its manager. Working under annually elected presidents, he has held this post since 1945, when he succeeded the late George E. Lewis.

Electrical Firsts

Since John F. Vail was elected first president of the original Colorado association, the continuing line of organizations has racked up a number of electrical firsts.

The Colorado Electric Club, which picked up the baton in 1909, sponsored the first electric show west of the Mississippi a year later.

Outdoor Christmas lighting had its origin in Denver in 1914. That year David Sturgeon, son of the president of Sturgeon Electric Co, asked his father to put Christmas lights on an evergreen he could see from his sick bed. David died, but next year neighbors decorated their trees with lights, and the practice spread across the land. Now, as elsewhere, the league sponsors "Christmas Lane" on Denver's main street, putting up a lavish display of light.

In 1928 Edward Rowland, Public Service Co of Colorado, spearheaded promotion of indirect lighting with the slogan, "The better the light, the better the sight." In shorter form, this phrase now is presented to the country by a national bureau interested in light and sight.

Novel black light effects were originated in the thirties for the group's expositions and promotions. Many have since been picked up for theatrical use.

April 1, 1937 marked the beginning of the present League. On that date Rocky Mountain Electric Association and the Electric League of Colorado were merged and Guy W. Faller was elected as its first president.

Since then many promotional campaigns and technical developments have been credited to RMEL. For the future? The league can't go wrong, say Koch and Hubbard, if it sticks to its main objectives.

The Objectives

- To advance the art, knowledge and science of production, distribution and utilization of electrical energy.
- To foster, promote and develop all branches of the electrical industry, through cooperative effort.
- To promote public acceptance of electrical service through broader adaptation and uses of appliances, equipment and facilities.

The heads of RMEL wish Edison were here to see what the Rockies did with his idea the last half century. They'd also like to make him some promises for the next 50 years.

Operating Agency...

. . . formed by three Washington cities and three PUD's to carry out power plans

Formation of a new Washington state agency to build hydroelectric dams and transmission lines was begun this month at Ephrata, Wash., when representatives of three small cities and three PUD's, all in eastern Washington, signed resolutions favoring establishment of Washington State Operating Agency No. 1 under the new state power commission.

The Grant County PUD of Ephrata, which called the meeting, was first to sign, joined by Douglas and Kittitas County PUD's and the cities of Ellensburg, Cle Elum, and Cashmere. The preliminary proposal envisions establishment of the organization's office and operating headquarters at Ellensburg.

Others May Join . . . A number of other cities with municipal power systems, as well as PUD's, indicated they supported the proposed organization but wanted more time to study it before officially going on record. The 85 representatives agreed to keep the organization open until Jan. 15, after which the state power commission will be asked for authority to create the new agency.

Glenn Smothers, manager of the Grant County PUD, described the proposed organization as "one to be used when all other means of financing power systems have been exhausted, not an organization intended to replace any of the present power system plans." Its first project is likely to be construction of two dams on the Columbia River at Priest Rapids near Ephrata, producing nearly 1 million kw. This project would cost an estimated $300 million.

No Decision From Big Cities . . . The agency probably would have difficulty in achieving operation unless it enlists the cities of Seattle and Tacoma. Tacoma said it could not make a decision until January while E. R. Hoffman, superintendent of Seattle City Light, said Seattle has three other plans for power projects which may come ahead of the proposed Priest Rapids project.

Seattle's probable No. 1 development, Hoffman said, will be a higher dam at the Gorge site on the Skagit River, adding 50,000 kw, followed either by the raising of Ross Dam on the Skagit or the development of the boundary site on the Pend Oreille River.

"But we are not closing the door on possible action to join in the Priest Rapids development later," Hoffman said.

Power Parley Scheduled

Power interests in the four Pacific Northwest states will be invited to a meeting at Seattle to be held about Dec. 1 to discuss plans for regional development of the Columbia River, governors of the four states decided at a conference in Olympia, Wash. Governor Len Jordan called the Olympia conference, with Governors A. B. Langlie of Washington, P. L. Patterson of Oregon, and J. Hugo Aronson of Montana also participating. They agreed federal, state, and local agencies of government and private power interests would be asked to cooperate in the plan.

Municipal Officials Tour Plant as Guests of Utility

Jersey Central Power & Light Co last month took 25 municipal officials from three Manasquan River communities on a tour of Potomac Electric Power Co's Potomac River Station in an effort to convince them that all steam stations are not the source of soot, dirt, and noise.

The Jersey utility plans to build a $35-million generating station on a 38-acre island it has purchased on the Manasquan River. But these plans have met with strong objections from South Monmouth County residents. The 425-mile round-trip junket to the Pepco plant was arranged by Jersey Central because it resembles station it plans to build.

At the Pepco plant the officials of Point Pleasant Beach, Point Pleasant, and Brielle were shown how the company controls soot and smoke from the plant's stacks and how dust and dirt from coal storage piles are dealt with. Mayor of Alexandria also told the visiting officials that the Potomac plant is an asset to the community.

POWER BRIEFS FROM THE NEWS

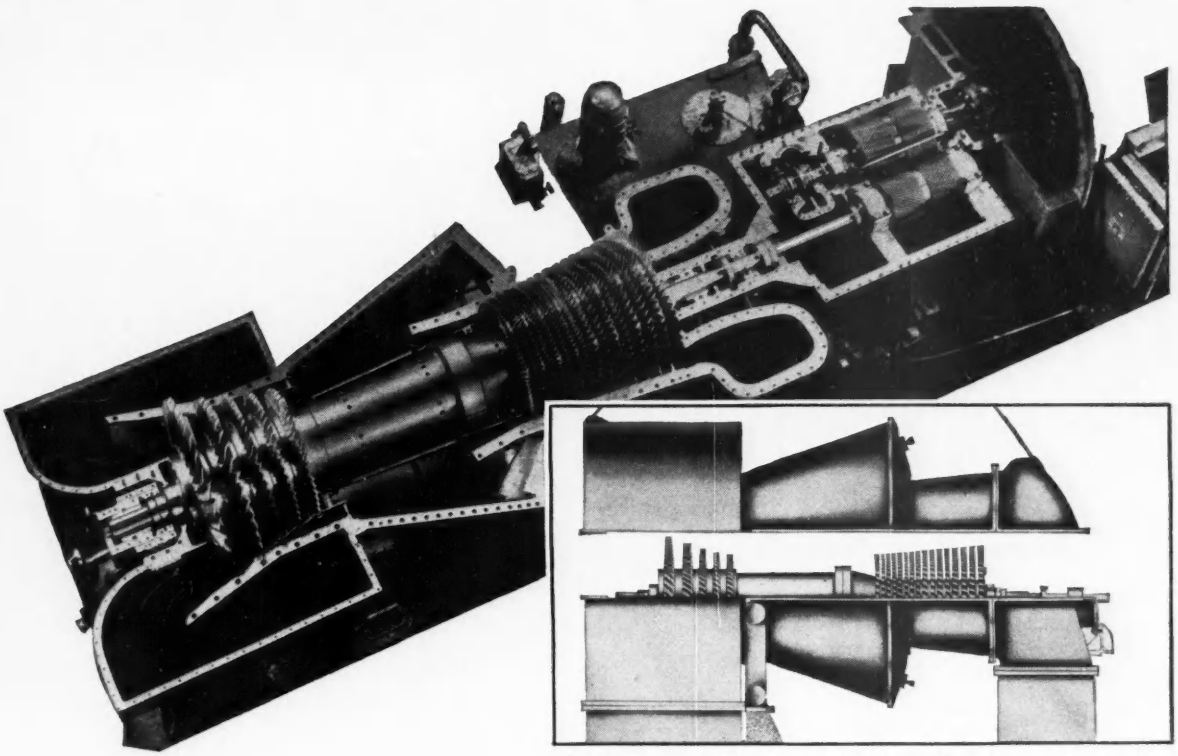
● The 60-mile cable-laying operation across the bottom of the Baltic Sea from Sweden's mainland at Vastervik to the island of Gotland has been completed. The project is reported to be the longest underwater transmission of high voltage current on a large scale in the world. Power will start flowing through the new cable in 1954. Sweden's mainland ac grid will transmit 20,000 kw at 100,000-dc volts through the cable to Gotland. The cable, was built in two seamless lengths—a shore length of 12 miles and a sea bed length of 50 miles.

● Plans for the construction of a 100,000-kw, $14-million steam electric generating plant in the Salt River Valley portion of central Arizona near Phoenix have been announced by Arizona Public Service Co. Construction is scheduled to start in the spring of 1954. The proposed plant is expected to be completed and placed in operation by the spring of 1956.

● Establishment of Edison National Park on a 12,000-acre tract in the Delaware Water Gap area in New Jersey and Pennsylvania is envisaged by Walter van Broock, a former Pocono Mountains hotel manager, who has marshalled Edison Pioneers and General Electric Co executives to support the project. The park, to be named for Thomas A. Edison, would be equally divided between the states. Legislatures of New Jersey and Pennsylvania will be asked to act upon the idea in the near future.

● Federal Judge Bryan Simpson has dismissed an anti-trust suit of the Okefenokee Rural Electric Corp against the City of Jacksonville, City Utilities Commissioner J. Dillon Kennedy, and the Florida Power & Light Co. REC had charged the defendants had persuaded the Florida State Road Department, in a conspiracy in violation of anti-trust laws, to deny the REC a permit to extend its lines along Highway 17 in Duval County.

● Louisiana Power & Light Co has started construction of a new addition to the Nine-Mile-Point plant to house a new 135,000-kw unit.



Main illustration shows how center line split makes complete turbine easily accessible. Flanges for separate bearing covers can be seen at either end of rotor shaft. Easy casing removal using overhead hoist is demonstrated in side view above.

WESTINGHOUSE 5000-KW GAS TURBINES . . .

Split down the center line . . . to save inspection time, ease maintenance

The entire turbine and compressor on this Westinghouse Gas Turbine are exposed by just lifting one single casing. Inspections are quickly made using light lifting equipment in readily available overhead space—hazardous manhandling and rigging at floor level being kept to a minimum. Lifting is logical, too, because it follows long-established electric utility practice . . . is the most *expeditious* way to open any turbine. Westinghouse also uses split bearing casings to ease maintenance. With no bearings buried inside, each end bearing has its own separate cover plate. This *end* bearing construction also eliminates hot seals and special bearing cooling. It's an important maintenance time saver.

These and such other features such as easily removed radial combustors and no high-pressure internal air or gas seals recommend the Westinghouse 5000-kw Gas Turbine for electric power generation. Use it for base load where fuel is cheap; for reliable peak, stand-by and end-of-line loads; for locations where water is scarce or expensive, or where mobile or semi-mobile plants are required. Let experienced Westinghouse Power Plant Engineers help solve your generation problems with one of the above applications. Get the complete story from your local Westinghouse office or by writing Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-50563

YOU CAN BE SURE...IF IT'S

Westinghouse

Helping the industry meet its growing loads

Solved:
A long-time problem in high-voltage switching

A low-cost switch to *safely* interrupt load currents on high-voltage transmission lines has long been the need of utility engineers. Conventional disconnects are not suitable for this job because of the ever-present danger of an unconfined arc causing a fault.

Now, after a great deal of interesting research, Westinghouse engineers have developed the VLB switch which not only safely interrupts load current, but also line-charging currents and transformer magnetizing current.

The VLB switch is essentially a standard disconnect with the addition of a small interrupter chamber. The interrupter chamber, permanently sealed and gas filled, houses the contacts which are the current interrupters. These contacts are actuated by a quick-break mechanism which, in turn, is tripped by the main switch blade as it rises, after being released from the stationary contact jaws.

Development of the VLB switch was complicated by the factors that had to be considered—weight, size and cost. These requirements were met by the use of sulphur hexafluoride, SF_6, halogen compound gas, with an arc interrupting ability *100 times better than air*. Less than six inches of contact separation are required in SF_6 at atmospheric pressure to interrupt 115-kv circuits. Interruption is further improved by application of the De-ion® principle: small puffers blow fresh un-ionized gas through the arc when the contacts open.

The great expansion in today's power systems makes the new VLB switch all the more timely. It is another good example of constant efforts by Westinghouse to provide the utility industry with quality equipment designed to help solve operating problems.

J-97175

YOU CAN BE SURE...IF IT'S
Westinghouse

The intriguing properties of sulphur hexafluoride

The superior dielectric qualities of many of the halogen compound gases have become known to science during the last 15 years. Of particular interest to Westinghouse scientists is sulphur hexafluoride (SF_6) which is extremely stable and inert, remains a gas down to comparatively low temperatures (–62°C at normal pressure), and is comparable with oil in dielectric strength at only 30 pounds per square inch gauge pressure. Using these known qualities, it wasn't long until the engineers discovered, with the aid of a small test interrupter, that the currents which could be interrupted in SF_6 were 100 times greater than with air!

The arc quenching ability of SF_6 is far out of proportion to its straight insulating ability as compared with air. This results from the fact that the main factor to consider in arc quenching is not so much the dielectric strength of the medium used as its *rate of recovery* of dielectric strength, near current zero. It is the high rate of recovery of dielectric strength of SF_6 which makes it more desirable than air or the other halogen compound gases for arc quenching. A discussion of SF_6 entitled *An Investigation of the Arc-Quenching Behavior of Sulphur Hexafluoride* has been put in pamphlet form by Westinghouse engineers. Write for a copy.

Gas lasts life of switch

The interrupter is permanently sealed with 30 psi of gas pressure. It will interrupt nameplate rating at only 15 psi gas pressure, thereby assuring long life and dependable operation. Pressure is shown on a gauge which can be read from the ground. Since practically no gas is used in the interrupting operation, it is not anticipated that any recharging with gas will be necessary during the life of the switch.

100 miles, 600 amperes, or 100,000 kilovolt-amperes

The VLB switch is available in ratings from 7.5 kv to 115 kv with a continuous capacity of 600 amperes. This means that the VLB can be used for interrupting load current of 600 amperes, charging current for 100 miles of line, and magnetizing currents for transformer banks up to 100,000 kva. Since it requires only slightly more space, the VLB can be used to replace conventional disconnects.

Extensive tests in the lab and field

Like all Westinghouse products going into critical service, the VLB has undergone exhaustive testing in the laboratory and in the field. The 115-kv switch was set up with 70 kv across the contacts (the value encountered in 115-kv service). Under these conditions, it successfully interrupted 600 amperes at 50% power factor for 230 operations. The same switch then interrupted 56 amperes of static capacitor current 100 times and was in good working order at the conclusion of the test. Another unit interrupted 90 amperes of capacitor current on a 34.5-kv system a total of 2020 times.

Units have been extensively tested and are now in service on the Niagara Mohawk Power Corp. system. For more information on VLB switches write: Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pennsylvania.

by every measure of value... it's good business to buy...

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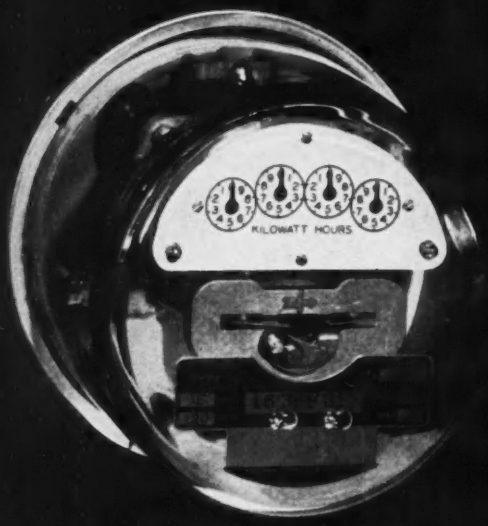
Sangamo . . . Good Meters Since 1899



Sangamo Type J . . . Performance-proved by thirteen years of service

For thirteen years J Meters have met and exceeded every requirement of performance for the Utility Industry that has been imposed by continuously growing loads.

These thirteen years of satisfactory service are a measure of proof of the electrical and mechanical stability of the J Meter—the design that mounts the moving element, damping magnets, register, and the electro-magnetic system on a single rigid frame.

These thirteen years have also proven the ability of the J Meter to sustain accuracy, reduce operating costs, save maintenance expense, and provide ample capacity for the load growth of this period.

Thus, by every measure of value it's good business to buy Sangamo Type J Meters.

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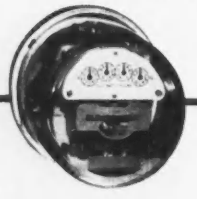

Only Measured Facts are Known Facts

JM11-6

How New Orleans Public Service Goes About . . .

Planning an Entry for an EEI Lighting Award

E. R. TSCHIRN, Commercial Sales Representative, New Orleans Public Service, Inc, New Orleans, La.

Is there such a thing as a magic formula for producing a winning entry for an EEI Planned Lighting Award? Of course, these awards are based on company efforts and results and the entry is merely a means of presenting these facts. But outstanding work should not be jeopardized by an inadequate entry. So when the awards are given out by the "Better Light—Better Sight" Bureau and EEI next year, that question will again be asked by many who are competing for the coveted plaques and prizes.

Certainly no patterns of performance can be established because promotions and results depend on many variable factors. Likewise, there is no magic formula for putting these promotions and results into a prize winning entry. Experience has shown, however, that there are ways in which the planning and preparation of the entries can be made easier and more effective. In preparing an entry this past year, New Orleans Public Service followed certain simple steps, a discussion of which may prove helpful to others.

Advance Work Needed

In the first place, "*planning* on entering" should be taken literally. Planning the entry well in advance will save a lot of work and confusion. Decide early which categories—commercial, industrial, or residential—your company should enter; then you will be in a position to keep up with the promotions and results in these categories as they occur. Photographs of activities, exhibits and installations insure a wealth of material to illustrate the efforts made. Forms designed to accumulate the facts and figures will mean a relatively simple job of tabulation when the time comes to prepare the entry.

The design and use of such forms will depend on the information desired. For example, when our company decided to submit an entry for 1952, a "Planned Lighting Installation Data Sheet" was designed to give key information and facilitate reporting results. The individual commercial representative used these sheets to report the facts each time E.A.R. was reported. Using this form, he was able to describe briefly, but completely, each source of E.A.R., including a description of the fixtures installed or used and the better lighting results obtained. The sales aids used by the representative and the consultants working with the customer were also noted on this sheet.

The information gathered from these sheets provided a large part of the results available for tabulation when it came time to prepare the entry. Even if we had not entered the competition, the information provided by this form would have been invaluable in making plans for future sales.

Before the entry is prepared it must also be decided how much should be included in the entry. Of course the scope of the entry varies with the individual company. In our case we tried to cover completely the year's activities without going into unnecessary details. Well in advance of the deadline, each electric company will receive an announcement of the competition which outlines the rules of the contest. Protect your investment in time and work, make certain these rules are understood and prepare the entry according to them.

Helpful Outline

This announcement, which is sent out by the "Better Light—Better Sight" Bureau and EEI, also contains an outline of points to be judged. This outline can be extremely helpful in organizing the entry. Our entry generally followed this outline and doing so gave a constant check on adequate coverage. Against this outline all evidence of our Planned Lighting activity for the year was checked for relevance. Everything included should evidence the success of the efforts and the genuineness of results. Photographs are particularly effective in

PICTORIAL PRESENTATION of promotional literature used during 1952. By photographing bulky materials such as booklets, pamphlets, etc, one page can show 20 to 30 items.

the 1 source for all types of utility bodies and equipment!

Whatever your utility body needs may be . . . from a set of compartment sections for a pick-up truck to a line body capable of handling the largest construction job . . . there's a POWERS-American Body designed to meet your requirements.

Available for construction, maintenance, and service work in all phases of the public utility industry, POWERS-American Bodies are "job-engineered" to step up crew efficiency and lower operation costs. Their quality construction guarantees long life and trouble-free service.

Whether your needs be large or small, standard or special, you'll find it a real economy to call POWERS-American . . . the 1 source for all types of utility bodies and equipment.

Look at all the features you get in POWERS-American Bodies

"Job-engineered" design • Equalized load distribution • Extra large weathertight compartments • Triple-seal compartment doors • Recessed slam-action door catches, with cylinder locks keyed alike • Additional line body features include: low-positioned rubber goods compartment • Full-size compartments on street side • Derrick stowed without interference to cab door or loss of compartment space • Extra depth in all compartments • Horizontal compartments for long material.

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doing this. As a matter of fact, an intelligent use of photographs helps reduce your entry to its essentials. For example, by photographing bulky materials—such as booklets, pamphlets, and mailing pieces—one page can show possibly 20 or 30 items.

All the sections of the entry—the Introduction, Educational Activities in the Principles of Better Light, Better Sight, Organization and Methods, Advertising and Promotional Activities, Cooperative Activities with Sales Allies—were organized to make the entry flow smoothly. These sections led to the climax: results. Particular attention was given to this section which included every concrete result of the Planned Lighting promotion. The final touch was a recap of the 1,206 planned lighting installation sheets which had been so diligently maintained throughout the year.

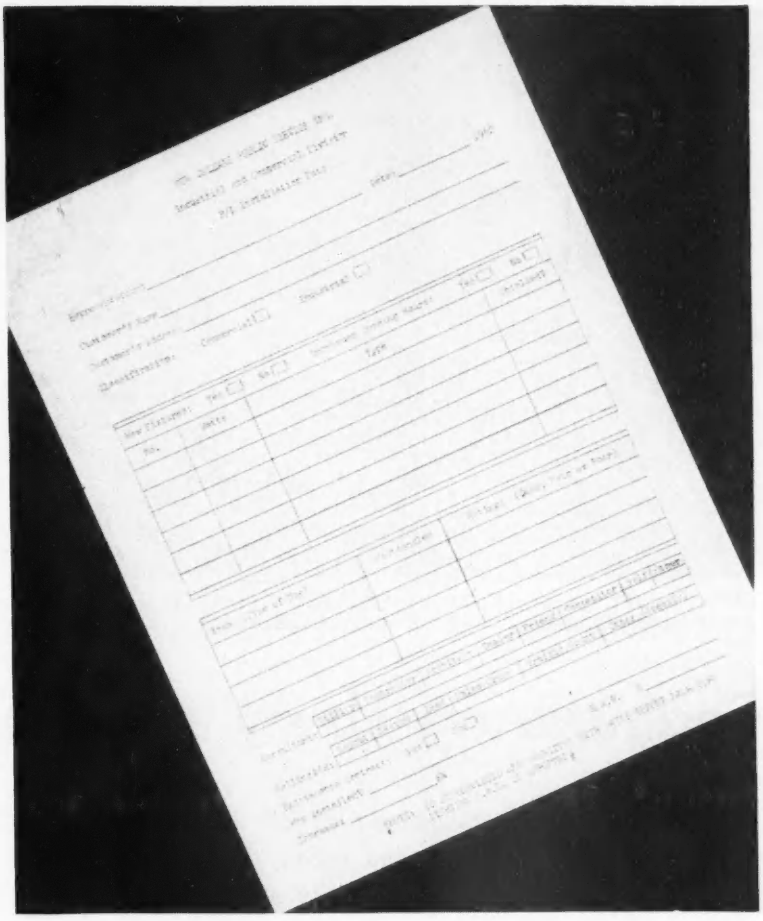
To sum up these steps which can make the production of a Planned Lighting Award entry simpler and more effective: first, plan well in advance and accumulate the evidence of your work as you go along. Also, follow the rules and suggestions which are in the contest announcement. Organize the material for a smooth flow; and be concise.

Naturally everyone would like to win, but experience has shown that other benefits can be just as rewarding. For instance, while collecting evidence of efforts and results the company will accumulate data valuable to other company activities.

The entry, as a summation of the year's activities, gives top management a better perspective of the sales department's revenue building promotions.

Probably the most important "by-product" benefit is the effect the entry has on department personnel. All will be proud of the entry and those who work on the entry will gain a greater appreciation of planned lighting.

They will have a greater appreciation of how to promote it and the great benefits it brings to customer and company alike.



DATA SHEET for Planned Lighting installation information containing accumulation of facts and figures aids tabulation when preparing entry

Smaller 200-W Lamp

A 200-watt, standard-voltage incandescent lamp of the same physical size as the usual 150-watt PS-25 lamp has been announced by the Westinghouse Electric Corp. Designed to replace standard 200-watt PS-30 clear and inside-frosted lamps, this smaller lamp lends itself to use in places where the larger bulb would not fit, thus making it possible to obtain increased illumination from luminaires previously limited by bulb size.

"How Much Will It Add to My Bill?"

"To Help You Figure Operating Costs of Electrical Appliances" is the title of a circular distributed by New Jersey Power & Light Co to dealers, contractors and others concerned with sales of appliances. Quoting the company's residential rate, the circular explains the calculation of costs of operating the various household devices. Pocket size, it is printed on heavy stock to withstand continual handling.

Fluorescent Gets Japanese Royal Nod

For the first time fluorescent lighting fixtures have been installed in the Japanese Imperial household. Day-Brite Lighting, Inc, of St. Louis recently received this information from its Japanese licensee, Tokyo Shibaura Electric Co, Ltd, with the comment:

"We are firmly convinced that these fixtures will bring not a little comfort to their Majesties, the Emperor and Empress, on lighting."

"Eyease" Kitchen Light

Using the new white inside-silica coating, Solar Electric Corp has produced a new 150-w "kitchen light" bulb. Light output is the same as regular inside-frosted lamps of the same watt size. It has an average rated life of 1,000 hours.

AIEE PRESIDENT E. B. Robertson (third from left) greets C. G. Roush, at AIEE Fall General Meeting at Kansas City for which Roush served as general chairman. C. M. Lytle, vice-president, District 7, left, and W. M. Talbot, Federal Civil Defense Administration, right, look on

Engineering Unity Moving Slowly . . .

. . . Robertson, AIEE president, advises Fall General Meeting at Kansas City. Technical papers and discussions cover many topics of interest to utility men. Progress on boiler design reported

Efforts to foster unity among the various branches and societies of the engineering profession are not progressing too well. In making this assertion at the Fall General Meeting of the American Institute of Electrical Engineers, Pres E. B. Robertson proclaimed the institute's willingness to cooperate and meet other segments of the engineering profession more than half way.

But he warned that there is a limit to how far AIEE is willing to go. Its interest is purely that of individual members. It will strive for what members in polls have said they wanted.

Robertson also expressed concern over student membership which is being affected by the drop in enrollment in engineering schools. With the future of the profession at stake, more activity is needed to enlist students in AIEE, he said.

Papers and discussions at the weeklong sessions at Kansas City included a variety of subjects of interest to electric utilities. Among them were these:

1. Impact of boiler size on combustion and slag control.

2. System recovery voltages with very large generators.

3. Pipe-type feeder cable design.

4. Interconnected systems operating problems.

5. Causes and corrective measures for abnormal voltage conditions.

6. Industrial distribution systems.

Progress in Design of Boilers Reported

Boiler sizes have increased from 20 Mw in the 1920's to 180 Mw and are now moving toward 250 Mw. This evolution has brought combustion improvements to overcome slag difficulties. This recent move toward very large sizes has made it necessary to view the furnace as a cooling chamber rather than an optimum combustion chamber, G. V. Williamson, Union Electric Co of Missouri, pointed out.

With sizes, pressures, and temperatures all rising, higher gas temperatures are required at the superheater and reheater surfaces. And the proportion of total heat absorbed in the water walls has dropped from 56% in the 850 psi at 900 F era to some 15% for 4,500 psi at 1050 F, 1000 F reheat. Absorption in the superheater and reheater(s) has jumped from 21% to 81%. Slag avoidance in this new era, he feared, is forcing the sacrifice of much of the gains in furnace philosophy.

Williamson said the 1,200,000-lb-per-hr Joppa (Electric Energy, Inc) boilers with their 100,000 Btu per sq ft per hr heat release—requiring 42 wall soot-blowers—may have incurred a bit too much "crowding." Union Electric's Venice No. 2 boilers of 900,000-lb-per-hr rating and 72,000 Btu release had no wall blowers. It's Meramec boilers have a 925,000 lb rating. These initially had eight blowers, now have 32. He cited three potential solutions: (1) Radiant steam superheating surface in the sidewalls, (2) recirculation of flue gases, (3) radiant superheater surface in pendant loops.

With higher steam pressures, the pumped circulation boiler was viewed as freeing the designer from the close balance of natural circulation and thus permitting wider range in furnace shapes and height. Williamson intimated that boilers for critical pres-

W. N. McDaniel, Consolidated Gas, Electric Light & Power Co of Baltimore; C. T. Hatcher, Consolidated Edison Co of New York, Inc; W. A. Del Mar, Habirshaw Cable and Wire Division of the Phelps Dodge Copper Products Corp; and M. H. McGrath, General Cable Corp

sures could well be horizontal in pattern because they do not need the height for circulation differential of a natural circulation boiler.

Companion analysis of turbine-generator progress by E. H. Krieg, Stone & Webster Engineering, showed the number of designs available in each preferred standard size bracket. For the 150-Mw rating as many as 13 have been provided (20 or so if variations in exhaust blading are counted). Whether this is economically advantageous to the industry, Krieg did not say. However, he cited the advent of direct cooling of both rotors and stators along with direction of steam flow in the turbine to help alleviate thermal strains.

Proposed design for a 500-Mw, cross-compound, double-reheat machine (3,200 psi) was shown to follow a barrel pattern eliminating horizontal joint bolting and relatively thin wall section. Delivered cost (not erected) for the five available preferred standard 150-Mw units have a spread of $1,800,000 or $12 per kw.

Turbine-generator and boiler controls at Con Edison's Astoria Station have been extended to the point of automatic tripping to prevent serious damage to expensive major equipment. Authors H. A. Bauman, J. M. Driscoll, P. T. Onderdonk and R. L. Webb conceded that other systems might not "go along" for fear of unnecessary tripping and loss of capacity. But their philosophy is predicated on providing increased automatic protection to compensate for the increased capacity entrusted to fewer operators.

Such automatic control extends to thrust bearing failure, excessive vibration, exhaust hood and condenser shell pressures, loss of vacuum, overspeed, loss of field, and generator motoring.

Recovery Voltage Rises with Generator Rating

Maximum voltage recovery rates to be expected as the largest generators are applied on typical power systems will range from 5 kv per microsecond at 138 kv to 7 for 330 kv, according to I. B. Johnson, A. J. Schulty, and W. F. Skeats, General Electric Co. Maximum recovery rates tend to increase in proportion to the square root of the frame size. But short circuit duty increases in direct proportion. With 300-Mva units and short circuit duties in excess of 3,600 Mva, a maximum rate of rise of recovery voltage of 1 kv per microsecond is indicated the authors said.

Reasons why silvered-surface contacts fail or survive when subjected to repetitive arcing duty were given by W. R. Wilson, General Electric Co. Results of 60-cycle tests on contacts of varying thickness and shape indicated that contact life increases as the 4.7 power of silver thickness, the 1.5 power of diameter, and with decreasing surface curvature. Life decreases, however, as 3.7 power of current and is practically independent of voltage from 440 to 125. But lower voltages give greatly prolonged life. Bouncing at "break" reduces contact life more than at "make."

B. S. Beall and V. N. Stewart, General Electric, announced a new line of low voltage air circuit breakers with stored-energy closing mechanisms for the electrically operated types. The SS United States was equipped with the new line of LV breakers according to H. F. Hardy, Newport News Shipbuilding. The draw-out version is being installed on the carrier Forrestal. Hardy rated the line of circuit breakers as quite as well adapted to naval and merchant marine application.

J. S. Ambrose, Detroit Edison Co, mentioned possible hazard to a maintenance man if the stored energy is released while work is being done. Also the mechanism appears complicated. John May, I-T-E, concurred in this comment as well as to the relative inaccessibility of components for maintenance.

Pipe-Type Cable Precautions Discussed

Pipes used for pipe-type cable installations in the past have been too large and pulling sections too short, said R. C. Rifenburg, Consolidated Edison Co. He explained present

methods of calculating friction for cables pulled in pipe, using both cable formation and triangle formation. He also reported on tests made to determine the accuracy of these calculating methods.

Losses in non-magnetic pipe for pipe-type cable installations were analyzed by L. Meyerhoff, General Cable Corp. From examples he showed that losses will generally be lower with steel pipe than with available non-magnetic pipe. He developed a formula for determining pipe losses and indicated that they are maximum when pipe resistances are at critical values of 8 to 11 microhms per ft. Losses approach zero as resistance approaches zero or infinity.

Precautions to be taken when installing submarine cables were listed by Andrew Bodicky, Union Electric Co. They include:

1. Bury cables 5 ft or more to protect them from anchors, floating debris, and scouring of soft bottoms.

2. Avoid installations in the vicinity of sewers because of chemical discharges.

3. Avoid locations downstream from constrictions in streams, bridge abutments, or piles because turbulence of water will expose cables.

4. Lay cables in an arc with the bow upstream.

Cable crossings on bridges should be avoided if possible. But they can be operated successfully if precautions are taken, said D. C. Hawley, Kansas City Power & Light Co. Precautions recommended were:

1. Insulate cables from bridge to avoid stray currents.

2. Guard against vibration fatigue.

3. Install cables on north and east sides of bridges to avoid sun's rays.

4. Provide for cable expansion.

5. Install expansion joints in conduits at expansion joints in bridges.

Temperature variations at the bottom of Baltimore harbor average within a few degrees of the average annual air temperature, W. N. McDaniel, Consolidated Gas Electric Light & Power Co, reported. He described tests made to gather information to guide rating of cables operating in Baltimore harbor.

Without Transpositions Capability Suffers

Modern equipments on both communication and power circuits now permit operating long high voltage lines without transpositions, E. T. B. Gross, Illinois Institute of Technology, stated. Each case should be studied. In his paper he developed the methods of calculating electro-magnetic unbalance on such lines. Discussion indicated experience with adverse effects of unbalance including apparent reduction in terminal equipment capability, and the need for ways of making these calculations.

Inductive and capacitive unbalances are present in transmission lines which are not transposed, W. J. McNutt, General Electric, reported. Unbalance of such lines, with or without ground wire, can be reduced by increasing the spacing between conductors on the center phase. Other but less practical ways of reducing unbalance are increased spacing between phases and raising the height of all phases.

Abnormal Voltages Can Arise from Capacitors

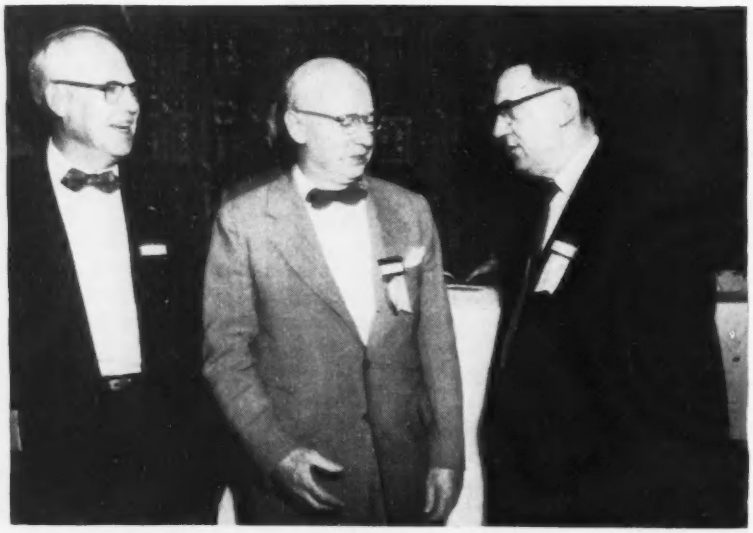
Opening of one or two phases of a 3-phase, 4-wire distribution system with ungrounded capacitor banks beyond the point of phase opening may cause high transient voltages, sustained undervoltages, or even phase reversal, P. E. Hendricksen, General Electric, reported in a paper prepared jointly with I. B. Johnson and N. R. Schultz. Corrective measures recommended were: Solidly grounding the capacitor neutral; use of 3-phase sectionalizing, where sectionalizing is the cause of trouble; grounding capacitor neutral through a resistor; and grounding capacitor neutral through a reactor.

Changing load patterns, with more inductive loads on networks, are prompting power companies to recognize the economic value of capacitors to secondary network systems, Hamilton Brooks, Westinghouse Electric Corp, reported. Recent developments in the manufacture of capacitors, he said, have resulted in smaller space requirements and decreased cost. New equipment designs have given particular attention to the problems of high current fault protection, corrosion resistance, and submersible operation.

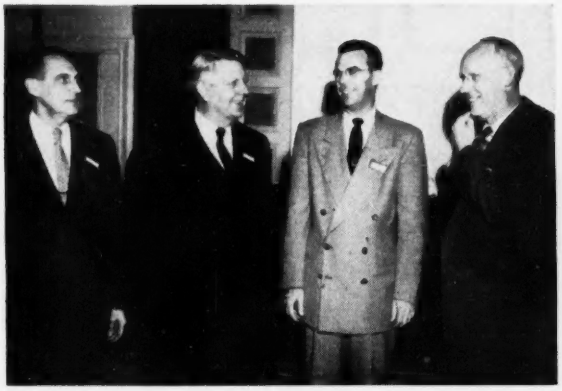
Analytical Methods Improve Substations

Tests to determine practical voltage-gradient and current carrying data on multiple ground-electrodes, commonly used in substations and for equipment grounding, were reported by H. R. Armstrong, Detroit Edison Co. Tests on model electrodes in an electrolytic trough were verified by field test data with the result that current-carrying capacity of simple electrodes can now be calculated. The two-second safe current density in the electrodes based on soil heating was found to be approximately one-tenth the critical current density for soil sparking.

A method of calculating transformer hot-spot temperature at any given time was described by G. H. Halsey, General Electric. The method takes



P. G. Wallace, Texas Power & Light Co; W. B. Morton, Pennsylvania Power & Light Co and AIEE vice president; and R. F. Danner, Oklahoma Gas & Electric Co and director of AIEE



F. V. Smith, Sargent & Lundy; W. A. Lewis, IIT; C. H. Prior, Los Angeles Bureau of Water and Power; and F. J. Vogel, Allis-Chalmers

J. P. Kesler, Black & Veach; F. E. Krause, Commonwealth Edison Co; R. J. Wiseman, Okonite Co; and A. F. Hartung, Burns & McDonnell

into consideration transformer thermal inertia and makes the calculations step by step as temperature increases. With it, transformer overloads can be planned, plans can be developed for most economical loading of transformers, and the calculations can guide preparation of specifications when buying a new transformer.

E. J. Adolphson and F. J. Vogel, Allis-Chalmers Manufacturing Co, described a method for calculating stray losses in transformer tanks which is expected to be particularly helpful in designing very large transformers. The information will also aid in determining where to place taps in the winding and whether to spread them out.

L. E. Sauer, Westinghouse, in a paper on duplex reactors showed how improvements in design had produced reactors of this type which would withstand forces which destroyed earlier designs.

System Engineers Improve Techniques

A simplified way to teach operating people how to use incremental loading techniques was described by R. T. Purdy, Commonwealth Edison Co. He showed how easy it is to select the wrong unit to take on additional load. The new method makes it easy for operators to analyze economics through to actual incremental costs. Transmission losses can be applied to incremental loading in a simple method described by T. W. Schroeder, Illinois Power Co. Sample calculations illustrated the savings that are possible. Incremental transmission losses were combined with incremental plant characteristics to determine most economical plant loading by J. B. Ward, Purdue University.

A method of determining capabilities of a synchronous generator operating in the region of unit and leading power factor was described by S. B. Farnham and R. W. Swarthout, General Electric. Problems involved, said the authors, are end iron heating and stability. If loads are increased without corresponding increase in field excitation, steady-state stability may become a problem. But automatic voltage regulators eliminate this problem.

Switching methods to avoid trouble from surges were described by E. L. Michelson, Commonwealth Edison. The paper was prepared jointly with C. McNamara. Several cases of trouble involving equipment damage were described and analyzed. Recommended switching practices were based on experiences and analyses of the causes.

Phase displacement to get desired circulating current for sleet melting on transmission lines was proposed by O. L. Oehlwein, Public Service Division, Commonwealth Edison. One method uses transformers with 60-deg phase shift connections. Several installations of this equipment have been made, chiefly on 34.5-kv lines, but studies on 132-kv lines are being made. Strong transmission tie between the ends of the circuit to be melted is essential.

System Grounding Promotes Safety

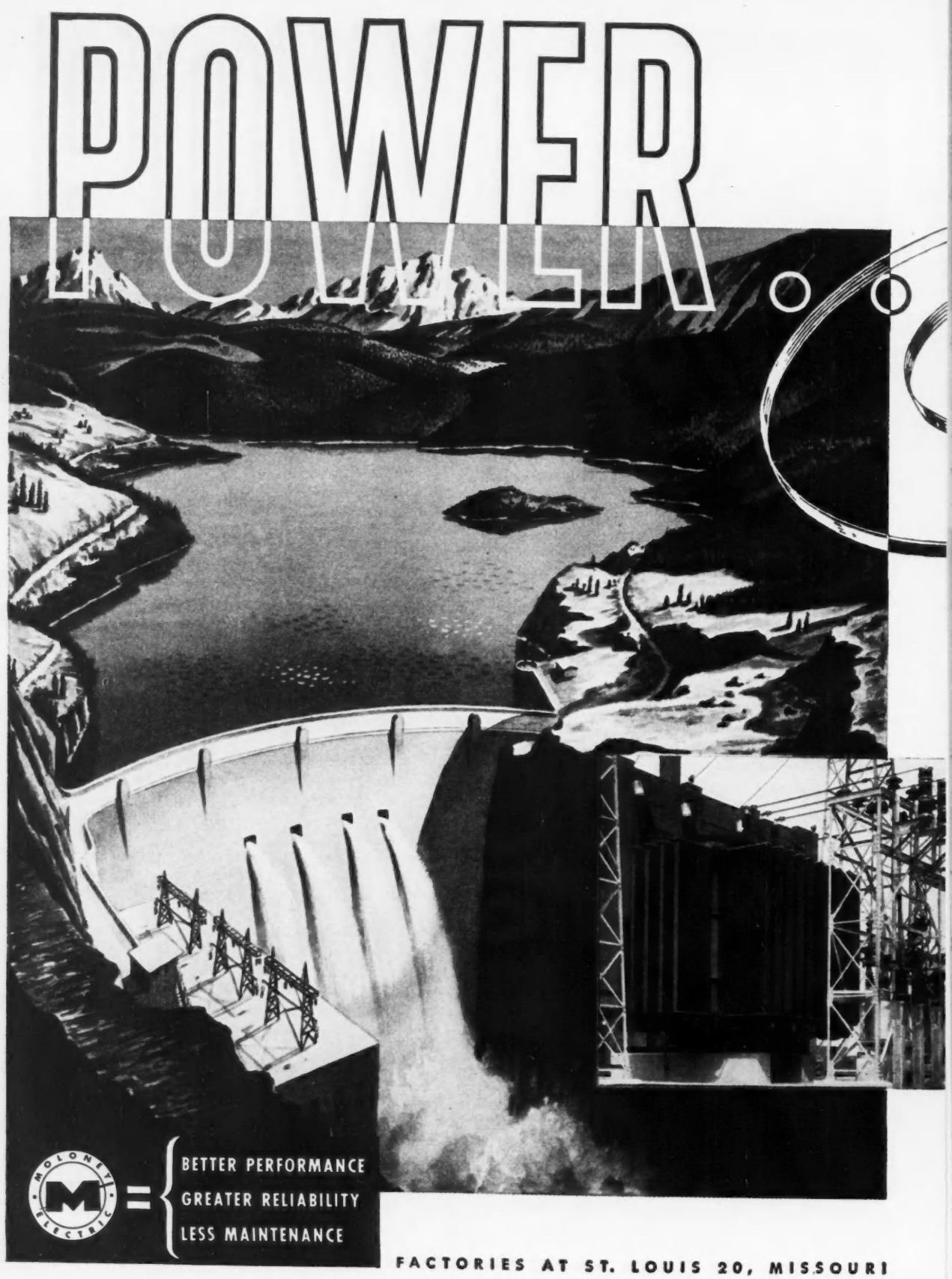
In an impressive demonstration R. H. Kaufman, General Electric, showed that with ungrounded operation a system is much more susceptible to overvoltages from transient conditions than with grounded operation. The result, said Kaufman, is accelerated deterioration of insulation. This results eventually in breakdown and failure of equipment. Experience in the field, he said, shows that grounding does not appreciably increase the outage rate.

Simplicity, safety, flexibility, reliability and reasonable cost were given by T. R. Shaw, Phillips Petroleum Co, as essential requirements for an electrical distribution system in a chemical plant or petroleum refinery. Need for highly reliable power supply and the relatively small investment compared to plant cost are important factors, he said.

Flexibility, reliability, regulation, efficiency, operation maintenance cost, and initial investment were given by R. F. Lawrence, Westinghouse, as factors determining the design of a power supply system for a chemical industry. He set up a scheme for weighting these factors which could be adapted to the needs for any case. Ten basic distribution system layouts were listed and analyzed on the basis of advantages and disadvantages of each in terms of different plant requirements.

Reliability of service, remote locations of stations and low cost of fuel at hand were given by J. K. Howell of Westinghouse as reasons why El Paso Natural Gas Co was generating its own power for its gas plants and pipe line pumping stations. The paper was prepared jointly with C. D. Catt of the Gas Company.

In the discussion which followed it was brought out that power companies are furnishing service of adequate reliability for this purpose in many locations and that some pipe line operators are changing to purchased power.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Modern industry requires a power source as dependable as the mainspring of a fine watch—central station electric power. But just as the accuracy of any watch depends as much upon jewelled bearings and gears that transmit the energy of its spring, your electrical system's dependability relies heavily upon the equipment which transforms and regulates the flow of power.

Moloney's famous greater "margin of safety" will give your system clock-like dependability . . . this means that Moloney Power Transformers stay on the job continuously and efficiently. The engineering, design and fabrication superiority that has been the mark of Moloney for 57 years results in transformers that perform better, with greater reliability and have longer operating life. Consider all the advantages that Moloney offers . . . and you'll install Moloney *all along the line.*

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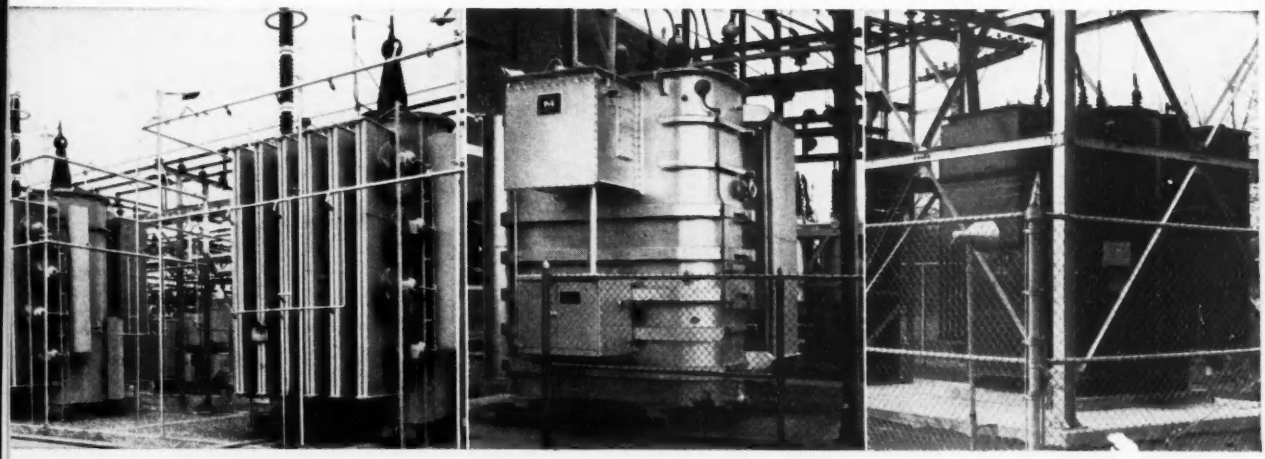

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Parish Is Named President . . .

. . . of Houston Lighting & Power. Texas utility also appoints Aicklen and Wharton as executive vice presidents

W. ALVIS PARISH

W. Alvis Parish, a vice president and director of Houston (Tex.) Lighting & Power Co, has been elected president of the company. Parish, a Houston attorney, replaces S. R. Bertron, who died recently after 38 years as an executive of the company, during the latter 23 of which he was president and general manager.

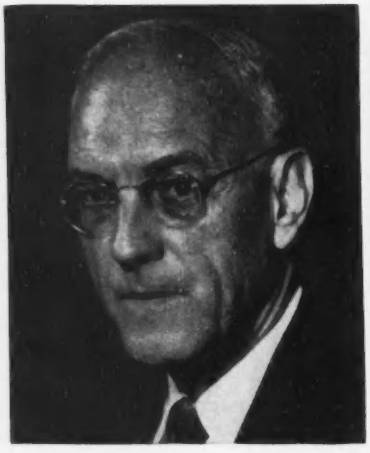
Executive VP's . . . The utility has also appointed two executive vice presidents. They are W. J. Aicklen, vice president and manager of the Galveston Division; and T. H. Wharton, financial vice president. Aicklen assumes the post of chief operating executive and Wharton, chief financial officer.

In assuming the presidency, Parish has resigned his partnership in the law firm of Baker, Botts, Andrews, and Parish in order to devote full time to the management of the utility's operations.

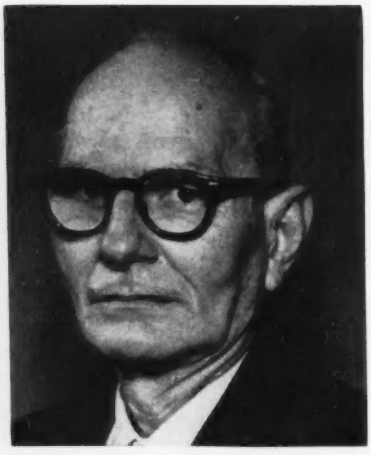
Parish's association with the utility began in 1914. That year Baker, Botts, Parker, and Garwood, the firm he was affiliated with as an attorney, was first appointed Houston L&P's legal counsel. He was elected to the utility's board of directors in 1917. He served in that capacity to the present time, except for two brief periods in the 1920's. In 1927 he was appointed a vice president and in 1935 a member of its executive committee.

Served as Division Manager . . . Aicklen, who started with the company in 1927, has been a director for 23 years and vice president for 13 years. In 1931 he was made manager of the Galveston Division. He has filled that post up to the present except during the years 1950 and 1951 when he acted as executive vice president during the illness and at the death of former Executive Vice Pres Hiram O. Clarke.

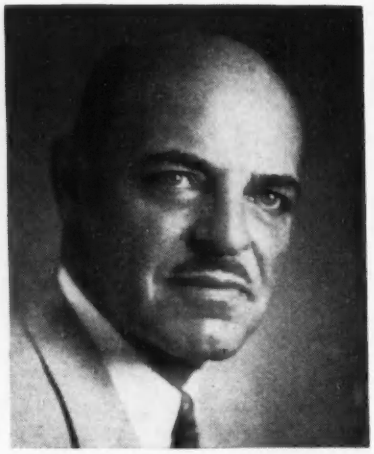
Wharton became affiliated with Houston L&P in 1922. He was made comptroller in 1944, a director in 1946, and a vice president in 1949.



W. J. AICKLEN



T. H. WHARTON



JOSEPH A. BUSCH

Northern States Power Appoints Busch a VP

Northern States Power Co has appointed Joseph A. Busch as a vice president to succeed the late Walter E. Olson (EW, Nov. 16, p 202).

Busch started his career with Northern States Power Co in its sales department in 1932. After working in various divisions of the utility, he was made manager of municipal sales in 1948. Two years later he was appointed assistant to the vice president in charge of sales.

In recent years, Busch has devoted a great deal of his time and efforts to promoting rural electrification, and working closely with state co-ops.

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N. F. Diederich has been appointed manager of engineering in the Switchboard and Control Division of Electric Products Co, Cleveland, Ohio. Diederich, an electrical engineer, spent 17 years with the Clark Controller Co, which he last served as manager of engineering standards.

Nema Elects Jewell President

Westinghouse vice president succeeds Lyle G. Hall as head of electrical manufacturers group.

J. H. Jewell, vice president in charge of sales for Westinghouse Electric Corp, has been elected president of the National Electrical Manufacturers Association. The Westinghouse executive succeeds Lyle G. Hall, president of Stackpole Carbon Co, St. Marys, Pa.

Other new officers elected by Nema included five vice presidents: Hoyt P. Steele, Benjamin Electric Co; William A. Elliott, Elliott Co; Frederick F. Loock, Allen Bradley Co; James W. Corey, Reliance Electric & Engineering Co; James L. Busey, General Electric Co; and treasurer, A. F. Metz, Okonite Co. Elected to the officers committee were: A. A. Berard, Ward Leonard Electric Co; and B. C. Neece, Landers, Frary & Clark.

Jewell joined Westinghouse in 1920. After completing a graduate student training course, he was assigned to the company's Philadelphia office as sales assistant. In 1930 he was made manager of the construction industry section of the same office.

Since assuming the section manager's post, he has served as manager of agency sales in the Middle Atlantic district, manager of the agency sales department for the entire company, and as manager of the industry sales departments from 1943 to 1947. That year he became manager of Westinghouse's apparatus sales department. He was elected a vice president in 1949.

J. H. JEWELL

•

Maynard W. Johnson, plant superintendent of General Electric Co's Distribution Transformer Plant at Oakland, Calif., has been named manager of the plant. Johnson succeeds **Paul R. Hartig,** manager of the plant for the past three years, who has been made manager of employee and plant community relations for the company at Pittsfield, Mass. Johnson, who joined General Electric in 1934, was made plant superintendent at the Oakland plant in April of this year.

Edwin E. Caspell, who has been works superintendent at the New Haven (Conn.) plant of the American Steel & Wire Division of United States Steel Corp, has been appointed general superintendent of the New Haven and Trenton (N. J.) plants. Caspell succeeds **Stephen B. Metcalfe,** who was named assistant district manager of operations of the Worcester (Mass.) district. Succeeding Caspell as superintendent at New Haven is **John J. Grimes, Jr.,** who has been superintendent of the wire rope department at the Trenton plant of the American Steel & Wire Division.

John H. Millington has been named manager of equipment engineering and development at the Westinghouse Electric Corp's Lamp Division headquarters at Bloomfield, N. J. Formerly a lamp-equipment supervisor at Canadian Westinghouse, Millington came from Hamilton, Ont., to the United States in 1946 as a design engineer. After a two-year assignment at Westinghouse's plant at Fairmont, W. Va., he was placed in charge of equipment development at the Bloomfield headquarters. Millington joined Canadian Westinghouse in 1937.

OBITUARY

Harrison Williams

Harrison Williams, 80, a utility executive once reported to control one-sixth of all American electric utilities, died at Bayville, L. I., Nov. 10.

Williams, whose investments in the 20's enabled him to gain control of Central States Electric Corp, had built an electrical empire led by North American Holding Co, which he served as board chairman. However, the Securities and Exchange Commission began breaking up his empire under the Holding Company Act of 1935. In recent years Williams shifted his funds to American Gas & Electric Co, of which he became a member of the board.

James H. King

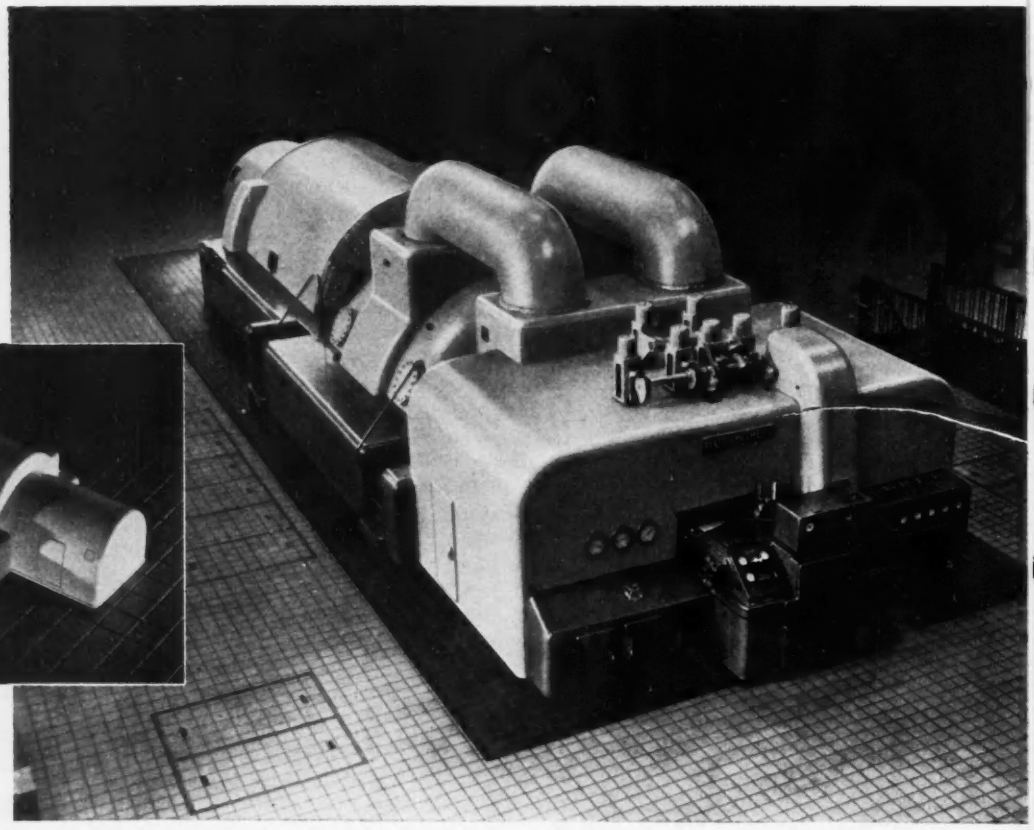
James H. King, 61, vice president and a director of Babcock & Wilcox Co, died Nov. 14 at New Rochelle, N. Y.

King became affiliated with Babcock & Wilcox in 1914 as a student engineer and was assigned to the marine department in 1917. In 1928 he was made assistant manager of that department and three years later was appointed manager. He was elected vice president in 1945 and named head of the Boiler Division seven years later. He was elected a director last April.

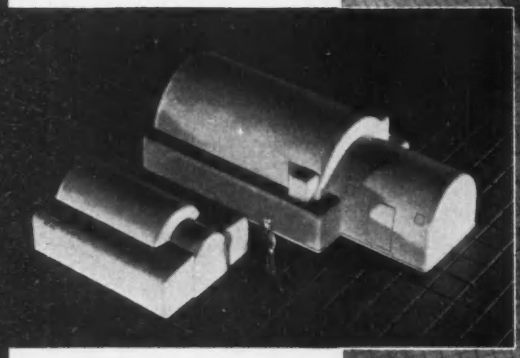
R. R. Van Horn, retired president of Luzerne County Gas & Electric Co, Kingston, Pa., now a division of United Gas Improvement Co, died at Wilkes-Barre, Pa., Nov. 12. He began with Luzerne County G&E in 1908. Before his elevation to the vice presidency in 1929, he served the utility as its attorney. He was named president of the utility in 1939, and retired in 1945.

Dallas W. Mallard, 48, art director of Electrical World, died Nov. 10 at Summit, N. J. Prior to joining EW in October, 1951, he served as art consultant. Previously he had worked for a number of other McGraw-Hill magazines.

Major Developments



At right: World's first *supercharged* hydrogen-cooled turbine generator — with direct rotor conductor cooling — installed at the Wisconsin Power and Light Company's Edgewater Station in 1951.



Above: Relative size of fully *supercharged* and standard hydrogen-cooled generators of the same kw rating.

Operation-Proved Supercharged Generator

Availability — 100%. On-the-line service factor — 97.41%. That summarizes the performance of the world's first *supercharged* hydrogen-cooled turbine-generator unit during its first full calendar year of operation.

By cutting generator size, *supercharged* direct conductor cooling permits smaller plant size, less expensive foundations, and smaller breakers and bus structures; minimizes mechanical design limitations; raises possible maximum ratings, and reduces field assembly problems.

That these advantages are obtainable has been proved in operation.

As a result, Allis-Chalmers is now building a completely *supercharged* generator resulting in the size reduction shown in the small illustration at left above.

A-4089

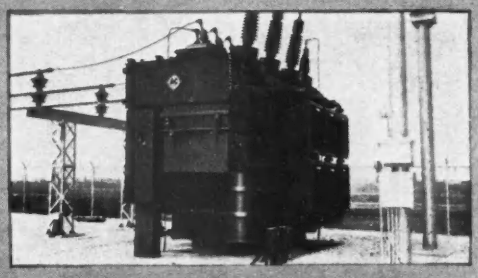
Equipment for Power: Water Conditioning equipment, chemicals and service . . . Steam and Hydraulic Turbines . . . Generators . . . Condensers . . . Steam Jet Air Ejectors . . . Power Plant Pumps and Motors . . . Transformers . . . Circuit Breakers . . . Switchboards and Control . . . Switchgear . . . Unit Substations . . . Utilization equipment.

ALLIS-

in Power Equipment

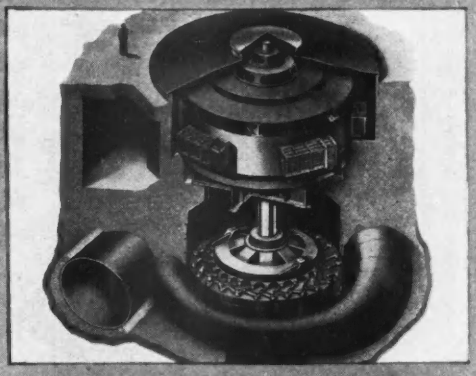
Corona-Free Power Transformers

Because Allis-Chalmers is building transformers rated 220,000 kva and others for 330,000-volt transmission, you can depend on A-C for units engineered to meet any application requirements. To check insulation aging, A-C transformers are designed to be corona-free even at highest test voltages. Without corona, transformers stay young, since repeated voltage stresses do not cause progressive deterioration of the insulation.



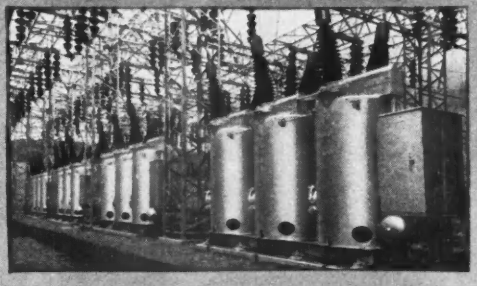
Reversible Pump-Turbine Units

Pioneered by Allis-Chalmers, reversible pump-turbines can solve some troublesome peak load problems. They do this by reducing the amount of equipment formerly needed for pumped storage operation; the single unit operates alternately as a turbine-generator and as a motor-driven pump. Five units are now in production, with turbine ratings ranging from 12,650 to 120,000 hp. The latter unit will combine the world's largest motor, with a rating of 102,000 hp, and the largest Francis turbine ever built.



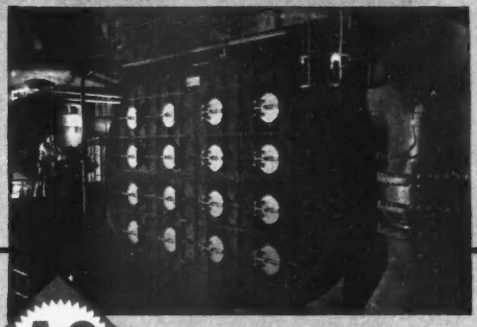
High Speed Circuit Breakers

As power systems grow, A-C circuit breakers keep pace with the new demands for size, speed and reliability. Mechanically trip-free pneumatic operators, originated by A-C in 1937, are in service on 20-20-20 cycle repetitive reclosing 3-cycle breakers. Now, hydraulic accumulator principles have been combined with proven pneumatic operation to produce the *Pneu-Draulic* operator and set new standards for large power circuit breaker speed and reliability.



Multi-Steam-Path Condensers

Allis-Chalmers is supplying six 100,000 sq ft surface condensers for the 2,200,000 kw of added private utility capacity being provided for AEC's Ohio diffusion plant. A-C multi-steam-path condensers have consistently helped to cut power costs. With 60 years of experience building over 13,000,000 sq ft of condenser capacity, A-C has the proven engineering and manufacturing facilities to build the largest condensers that might be required.



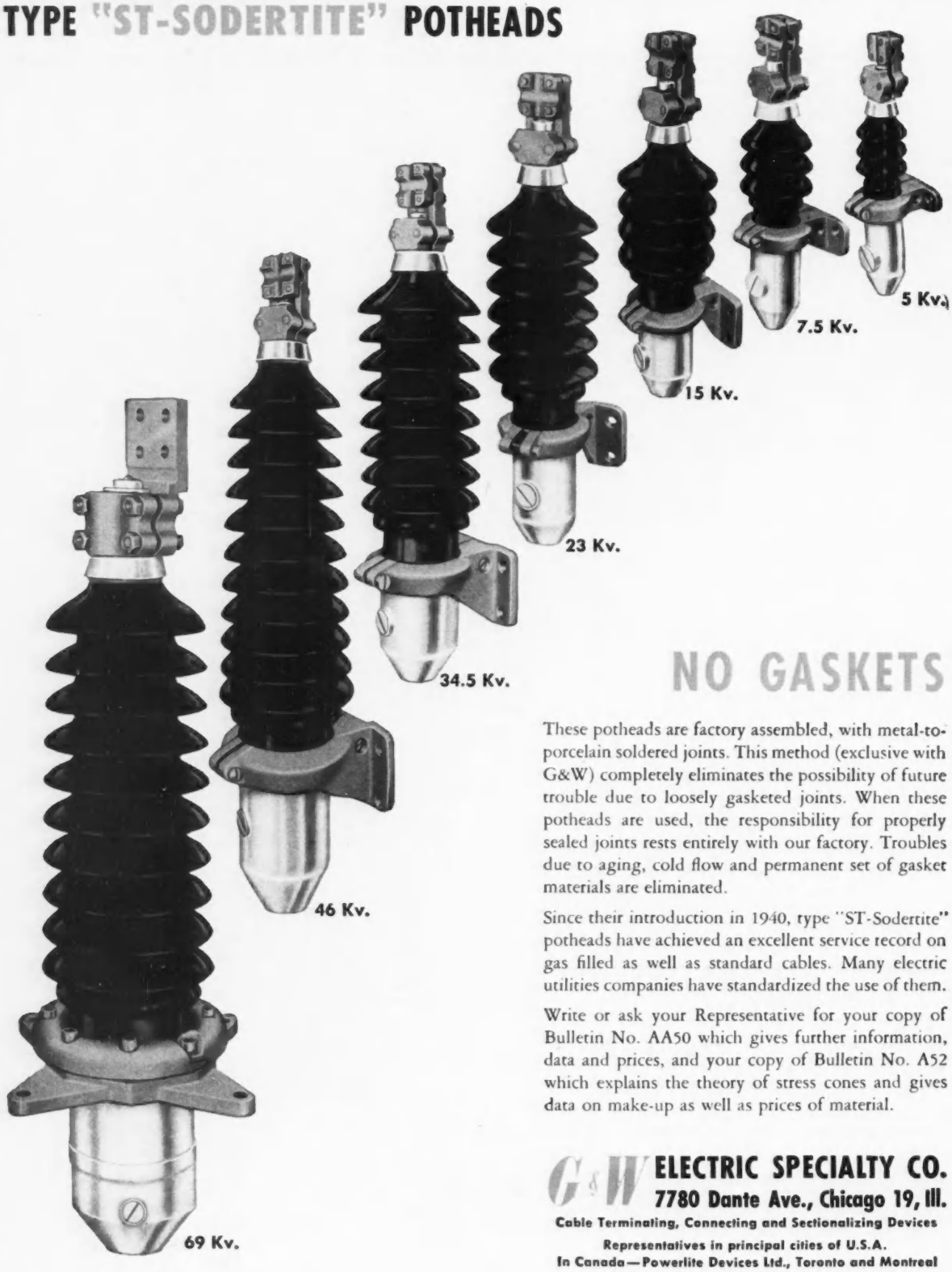
Pneu-Draulic is an Allis-Chalmers trademark.

CHALMERS

A-C ALLIS-CHALMERS

For more information, contact your nearby A-C representative, or write Allis-Chalmers, Milwaukee 1, Wis.

ASSURE PERMANENT PROTECTION FOR CABLE ENDS WITH G&W TYPE "ST-SODERTITE" POTHEADS



NO GASKETS

These potheads are factory assembled, with metal-to-porcelain soldered joints. This method (exclusive with G&W) completely eliminates the possibility of future trouble due to loosely gasketed joints. When these potheads are used, the responsibility for properly sealed joints rests entirely with our factory. Troubles due to aging, cold flow and permanent set of gasket materials are eliminated.

Since their introduction in 1940, type "ST-Sodertite" potheads have achieved an excellent service record on gas filled as well as standard cables. Many electric utilities companies have standardized the use of them.

Write or ask your Representative for your copy of Bulletin No. AA50 which gives further information, data and prices, and your copy of Bulletin No. A52 which explains the theory of stress cones and gives data on make-up as well as prices of material.

G&W ELECTRIC SPECIALTY CO.
7780 Dante Ave., Chicago 19, Ill.
Cable Terminating, Connecting and Sectionalizing Devices
Representatives in principal cities of U.S.A.
In Canada—Powerlite Devices Ltd., Toronto and Montreal

Here are the fundamentals that utility people learn:

1. Our job with the power company
2. Magnetism
3. An introduction to practical electricity
4. The terms we use
5. Sources of electrical energy
6. How alternating current behaves
7. Electric motors
8. Transformers
9. Instruments and meters
10. Generation, transmission, distribution

Central Hudson's course for non-technical workers is . . .

. . . Taking the ? Out of Electricity

For years Central Hudson Gas & Electric Corp management had been concerned with the fact that the electric industry did not have available for its employees an up-to-date and down-to-earth training course in the fundamentals of electricity.

One of the company's engineers took on the assignment of preparing the type of course it was felt was so much needed. With the help of recognized training leaders in the industry, there is now obtainable a modern authoritative course written exclusively for and within the understanding capabilities of the non-technical employees.

Not to Replace Specialized Courses . . . The course is not intended to replace courses for specialized workers. It was found, however, it does offer a sound and helpful grounding for the non-technical employees who want to take extra training and qualify for special work. For a greater number of employees, the training improves their personal satisfaction and effectiveness in their present work.

To date over one quarter of the non-technical employees, including some 50 women, have completed the training. The company made known the nature of the training and offered to furnish the instruction and pay one-half the cost of the employee's textbook, which became his property. The employees volunteered to pay their share and attend the classes on their own time, one evening a week for 10 to 12 weeks.

Young Engineer Instructors . . . The instructors are young engineers within the company. The text material is tied in with the company's operations. Most of the instructors had no previous teaching experience. But by following the "Teacher's Manual" prepared for the course, they did an outstanding job. At first, management was somewhat concerned that the training might put an extra burden on already busy employees. The experience has been that these class sessions carry on with little attention except that of manager of employee education and acting instructors.

Up to 20 in Each Class . . . Each class of not over 20 members includes employees from all three major departments, newcomers, oldtimers, linemen, stenographers, accountants, salesmen, all together voluntarily to get information qualifying them better to represent the place in which they work. Management believes every employee is "the company" at least to his family and his friends. Each has a potential worth over and above the satisfactory performance of his job.

Tackle Distribution Costs

Appliance manufacturers expect to achieve savings by centralizing their manufacturing facilities

Centralization of manufacturing facilities by appliance manufacturers is expected to bring about savings in distribution and manufacturing costs.

Now that most of its appliance manufacturing facilities are located at Appliance Park, Louisville, Ky., General Electric Co can go ahead with distribution methods aimed at lowering the cost of getting dryers, sinks, washers, and ranges from plant to consumer.

This distribution policy calls for GE's Louisville plant to ship for the first time mixed carloads of major appliances direct to dealers instead of to wholesalers as it does now. A mixed carload, consisting of an assortment of appliances, will go to buyers whose business is not big enough to warrant carload purchases of individual items. Previously these large purchases were supplied from distributors stocks.

Distributors to Remain . . . However, GE's program will not eliminate the distributors. They will continue to sell the appliances, finance dealers and aid them in their merchandising and service problems.

A GE spokesman said "Our new policy is an attempt to reduce the physical cost of distribution and ultimately prices. We figure that a dealer ought to be able to get a mixed carload of our products from the factory for about 4% less than he pays when he gets them from a wholesaler. For instance, he'll save on freight charges from the distributor's warehouse to his shop.

In addition, warehousing costs are eliminated and handling charges are greatly reduced."

To Cut Freight Charges . . . Westinghouse Electric Corp is shifting some manufacturing operations to cut freight charges on components of appliances. For instance, Westinghouse manufactures refrigerator compressor units at its Springfield, Mass., plant, then ships them to Mansfield, Ohio, where they are installed in the cabinet. Since the shipping time from Springfield is approximately seven days, this means there is always a sizable compressor inventory at Mansfield and in transit.

Westinghouse now plans to make both the cooling unit and cabinet in its new $45-million Electric Appliance Division plant at Columbus, Ohio. Thus eliminating the Springfield to Mansfield freight bill and the cost of carrying large inventories at Mansfield.

Completion of the first refrigerator this month at the new Columbus plant officially marked the production debut of the largest manufacturing plant Westinghouse has ever built. Although construction in some areas of the two-million sq ft plant has not yet been completed, a limited amount of production has been started by a force of 500 workers. The plant, which will eventually employ about 7,000 workers, will produce about 4,000 major appliances a day, most of which will be refrigerators and freezers.

Plants Close to Markets . . . Construction of plants nearer major markets is another method manufacturers are using to cut distribution expenses. This technique is being used by Sylvania Electric Products, Inc., which is building or has completed plants at Winchester, Ky., Batavia, N. Y., Mt.

Delivers 'Powerhouse on Wheels'

Westinghouse Electric Corp has delivered to Long Island Lighting Co a 3,750-kva unit which is reported to be the first portable electric substation to be used in the Long Island, N. Y., area.

This $60,000, 19-ton portable substation is designed for emergency service and in addition, will help relieve seasonal overloads on the utility's system. Based at LILCo's Hicksville central operating headquarters, the 20-ft long mobile unit can roll within 20 min after an emergency call is received and can be placed in operation at any point in Long Island within three hours. It can provide reserve capacity for three-quarters of the transformers presently in use on the LILCo system and can be operated at 33,000, 23,000 or 13,800 v primary and 4,330 or 2,500 v secondary as required.

View and Fullerton, Calif., and York, Pa.

When Sylvania starts supplying the West Coast with TV picture tubes from its Fullerton plant, now under construction, it expects to cut transportation costs an average of $1,300 on a carload of 21-in. tubes. Tubes are presently being shipped west from Sylvania's Seneca Falls, N. Y., and Ottawa, Ohio, plants.

To further cut distribution costs, Sylvania during 1953 added warehouses in the following cities to its distribution system: Philadelphia, Buffalo, Cleveland, Kansas City, St. Louis, and Ipswich, Mass. Sylvania also plans to increase warehouse facilities in Chicago next year.

MANUFACTURING BRIEFS

Sen Joseph R. McCarthy, (R. Wis.) chairman, Senate Permanent Subcommittee on Investigations, has questioned at closed sessions 11 witnesses about infiltration of Communist agents in General Electric Co's Schenectady, N. Y., plant. Senator McCarthy, it is reported, said nine of the ten unfriendly witnesses were members of the United Electric Workers, an independent union that was ousted by the CIO in 1949 as communist-dominated. The union is still the recognized bargaining agent at General Electric. The Senator has also reported that a witness said the Communist party also had agents in the Knolls Laboratory, a section of the GE plant connected with AEC projects.

Production of primary aluminum in the United States during September totaled 218,666,531 lbs, the Aluminum Association has reported. September output was lower than August's 221,090,007 lb.

SALES ASSIGNMENTS

COMPANY STAFFS

Cooper-Bessemer Corp, Mount Vernon, Ohio, has named R. G. Williamson as branch manager of its district office in Los Angeles. Williamson, a mechanical engineering graduate of the University of Southern California, has been undergoing engineering training at the company's plants located in Mount Vernon, Ohio and Grove City, Pa.

Graybar Electric Co, Inc, New York, has appointed E. L. Preston manager and H. L. Coldwell, operating manager of its new branch at Abilene, Tex. Preston, with the company for 28 years, was made a salesman at Fort Worth, in 1946. Coldwell joined the company in the operating department at Dallas in 1950.

MEETINGS CALENDAR

Public Utilities Advertising Association
Region 8 Meeting, Amarillo, Tex., Nov. 23-24; Region Two, Annual Meeting, Skytop, Pa., Dec. 10-11; Region 5 Meeting, Atlanta, Ga., Feb. 11-12; Region 1 Meeting, Montreal, Que., Feb. 25-26.

American Society of Mechanical Engineers
Annual Meeting, Statler Hotel, New York, Nov. 29-Dec. 4; Semi-Annual Meeting, William Penn Hotel, Pittsburgh, June 20-24.

Edison Electric Institute
Prime Movers Committee, Astor Hotel, New York, Nov. 30-Dec. 1; Street Lighting Committee, Dayton, Ohio, Dec. 1-2; EEI-AGA General Accounting Committee, Jung Hotel, New Orleans, Nov. 30-Dec. 1; Commercial Lighting Committee, Detroit, Mich., Dec. 2-3; EEI-AGA Customer Accounting Committees, Netherlands Plaza Hotel, Cincinnati, Ohio, Dec. 3-4; Financing and Investor Relations Committee, EEI Headquarters, New York, Dec. 9; Commercial Cooking and Water Heating Committee, Tutwiler Hotel, Birmingham, Ala., Dec. 10-11; Industrial Power and Heating Section, Sheraton Hotel, St. Louis, Dec. 10-11; EEI-AGA Accounting Employer Relations, Hotel Cleveland, Cleveland, Ohio, Dec. 14; Commercial Electrical Space Heating and Air Conditioning Committee, Canton, Ohio, Dec. 17-18; Industrial Relations Committee, EEI Headquarters, New York, Dec. 17; Accident Prevention Committee, Hotel Statler, Boston, Jan. 18-19; Industrial Relations Committee Joint Meeting with Personnel Administration Section, Southeastern Electric Exchange and Southwestern Personnel Group, Hotel Roosevelt, New Orleans, La., Jan. 21-22; EEI-AGA Taxation Accounting Committees, Arlington Hotel, Hot Springs, Ark., Jan. 27-29; Transmission and Distribution Committee, Hotel Cleveland, Cleveland, Ohio, Feb. 9-10; Electrical Equipment Committee, Sheraton Cadillac Hotel, Detroit, Mich., Feb. 15-16; Industrial Relations Committee, EEI Headquarters, New York, March 18; Sales Meeting, Edgewater Beach Hotel, Chicago, April 5-8; EEI-AGA Accounting Conference, Hotel Statler, Boston, April 12-14; Industrial Relations Committee, Netherlands Plaza Hotel, Cincinnati, Ohio, April 15; Annual Meeting, Atlantic City, N. J., June 1-3.

***Public Information Program**
Inter-Regional Committee, Monticello Hotel, Norfolk, Va., Dec. 4; Steering Committee, Hotel Biltmore, New York, Dec. 11.

Interstate Power Club
Hotel Martinique, New York, Dec. 7.

Eastern Joint Computer Conference-Exhibition
Sponsored by Institute of Radio Engineers, Association for Computing Machinery, and American Institute of Electrical Engineers, Statler Hotel, Washington, D. C., Dec. 8-10.

National Rural Electric Cooperative Association
Annual Convention, Dinner Key Auditorium, Miami, Fla., Jan. 11-14.

***American Institute of Electrical Engineers**
Winter General Meeting, Statler Hotel, New York, Jan. 18-22; Conference on Feedback Control, Claridge Hotel, Atlantic City, N. J., April 22-23; Northeastern District Meeting, Schenectady, N. Y., May 5-7; Summer General and Pacific General Meeting, Hotel Biltmore, Los Angeles, June 21-25; Conference on Telemetering, Morrison Hotel, Chicago, May 24-26.

Canadian Electrical Association
Eastern Zone Meeting, Chateau Frontenac, Quebec, Que., Jan. 18-22, 1954; Western Zone Meeting, Royal Alexandria, Winnipeg, Man., March 1-3.

National Industrial Electric Heating Conference
Industrial Electrification Council, Netherlands, Plaza Hotel, Cincinnati, Ohio, Jan. 18-22.

Missouri Valley Electric Association
Industrial and Commercial Sales Conference, President Hotel, Kansas City, Mo., Feb. 4-5; Engineering Conference, President Hotel, Kansas City, Mo., April 7-9.

Electrical Equipment Representatives Association
Winter Annual Meeting, Biltmore Hotel, Los Angeles, Feb. 8-11.

Southern Safety Conference-Exposition
Kentucky Hotel, Louisville, Ky., March 7-9.

National Electrical Manufacturers Association
Spring Meeting, Edgewater Beach Hotel, Chicago, March 8-11.

***National Association of Corrosion Engineers**
Tenth Annual Conference and Exhibition, Kansas City, Mo., March 15-19.

Southeastern Electric Exchange
21st Annual Meeting, Boca Raton Hotel, Boca Raton, Fla., March 22-24.

American Power Conference
Sherman Hotel, Chicago, March 24-26.

***Oklahoma Utilities Association**
Annual Convention, Biltmore Hotel, Oklahoma City, March 25-26.

***American Welding Society**
National Spring Technical Meeting, Hotel Statler, Buffalo, N. Y., May 4-7.

***CIGRE**
International Conferences on Large Electric High-Tension Systems, Paris, France, May 12-22.

***National Association of Electrical Distributors**
Annual Conventian, Atlantic City, N. J., June 6-11.

*Addition this week.

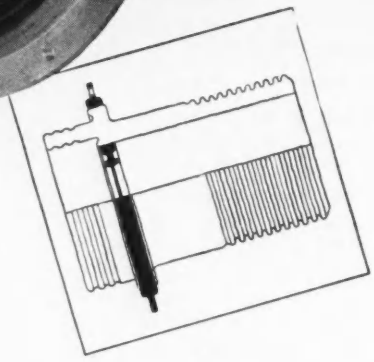
MANUFACTURERS' EARNINGS

Company	Period Months Ended		Net Income 1953	Net Income 1952	Earnings Per Common Share 1953	Earnings Per Common Share 1952
McGraw Electric	9	Sept.	$5,160,000	$5,364,000	$5.09	$5.30
Phelps Dodge	9	Sept.	27,900,835	25,643,671	2.75	2.53
Philco	3	Sept.	3,202,000	1,784,000	.88	.48
Philco	9	Sept.	15,418,000(a)	6,073,000	4.29	1.64

Notes—(a) Includes non-recurring income of $5,316,000, or $1.51 a common share.

THIS IS A MULTIPLE-DUTY INSULATOR:

BUSHING, BAFFLE, SUPPORT



Combined in this one assembly are a baffle insulator for supporting and sectionalizing the surrounding chamber of a totally enclosed tubular bus . . . and a porcelain bushing for a current transformer secondary. The combination in one unit creates a design which, even at Lapp, is a "difficult piece."

The porcelain is nearly 20″ in diameter, 25¼″ long, and weighs about 120 pounds. In this plant, its size and weight alone present no special problem, but difficulty does arise when such weight is combined with several other complicating factors. In the first place, the inside of one end is corrugated, an unusual and difficult operation. Then, at the point where internal and external hardware are attached, the total wall thickness is 3¼″—which poses a nice firing problem. Too, the diameters of the two ends are different, presenting a peculiarly difficult counterbore.

Only the finest electrical porcelain, skillfully produced and understandingly handled, combined with critically-controlled firing, could successfully produce such pieces. We are proud of them.

The plant superintendent is glad that not all insulators required in the electrical power industry are so complicated. He does point out, however, that his team did produce these pieces successfully, and that the same ceramic body, the same production techniques and skills, go into all insulators which bear the LAPP name. He wants it known that all Lapp products—components for system equipment, as well as insulators for transmission and station use—are built to give an extra margin of operating security, long life, and low upkeep.

His conviction merits your confidence.

Lapp Insulator Co., Inc., Le Roy, N.Y.

Lapp

FINANCIAL

Puget to Operate Separately

Pres McLaughlin says there is no further justification for negotiations with Washington Water Power and PUD's

After standing upon the brink of dissolution for several years, first through proposed purchase by a group of PUD's and in recent years through proposed merger into the Washington Water Power Co, the Puget Sound Power & Light Co decided Nov. 12 to continue to operate as a separate entity.

"In the light of present conditions, there exists no sound basis or justification for further extensions of the Washington Water Power merger and the PUD agreement, which presently have termination dates of Nov. 19 and 20, respectively," Pres Frank McLaughlin announced at Seattle, Wash., with the unanimous agreement of the company's directors. "Consequently Puget will remain in business."

Pres Kinsey Robinson of Washington Water Power, who had hoped for a continuance of the merger agreement, expressed "surprise" and "shock" when informed of Puget's action. Gov Arthur B. Langlie of Washington expressed pleasure "that the management has decided to stay in business" while the PUD's declared that, "if the Puget statement closes the door on joint or local future negotiations, then about the only course open is piecemeal condemnation."

Reasons Given . . . McLaughlin cited three factors making for the board's conclusion:

- "Both the merger and purchase agreements are currently tied up in litigation and there is no likelihood of either being consummated in the foreseeable future.
- "It is becomingly increasingly clear that the people of western Washington are fed up with the ceaseless bickerings, legal snarls, turmoil and strife which have afflicted them 'power-wise' for some time.
- "Puget became a party to the purchase and merger agreements in the light of the conditions then existing—mainly because it was indicated or represented that by such acts all stockholders who so desired might be afforded the opportunity of disposing of their stock so as to obtain around $27 per share cash by the consummation of either transaction within a reasonable period of time. Such has not proven to be the case and, because of current and threatened litigation, the merger and the purchase have stalemated each other absolutely."

McLaughlin emphasized that the company's outlook has substantially improved, the "climate" in which it operates is now much healthier, and its overall position the strongest in its history. It is this change of "climate" that appears to be one of the company's strongest reasons for continuing its separate existence.

Private Power Opposed . . . McLaughlin didn't say so, but many Puget Power customers in western Washington expressed distaste at a private power "empire" ruled from Spokane in eastern Washington, without the "home rule" that the PUD's have found so popular. Puget Power was never able to promote much sympathy for its alleged persecution by the PUD's but did receive a measure of public support, the first it had enjoyed for years, when "threatened" with the merger.

This change in climate, if McLaughlin is correct, also might hamper the PUD's in their condemnation efforts, if it creeps into the jury rooms. McLaughlin apparently further is banking upon the fact that condemnations are not so attractive to the PUD's as in former years, because of the severance damages now added to the actual value of the properties condemned.

Door Not Slammed . . . McLaughlin's statement, while ignoring the once-feared PUD condemnations and devoting little space to the proposed PUD purchase, gave much attention to an analysis of why the merger would not be in the best interests of the Puget Power stockholders. It did not shut the door on future negotiations but implied the price would have to be higher.

"Testimony brought out at the merger hearing before the commission clearly shows that from financial, present self-sufficiency of power supply, and other standpoints, Puget is a strong entity," McLaughlin said. "On the basis that other electric utilities are selling for on the market, and purely as to intrinsic value, Puget's common stock is certainly worth in excess of $27 per share," the price agreed upon both for the merger and purchase. Stockholders who wished to dispose of their stock at this price have been able to do so in the open market, he pointed out.

McLaughlin quoted evidence at the merger hearing that, "for the long pull, Puget's common stock is worth more than Washington's" and should be ranked superior, "the present stock market evaluation to the contrary notwithstanding." He repeated the prediction that the difference in market prices will be narrowed "and Puget will overtake and ultimately turn out with a higher market value than WWP."

Voicing the opinion that the most important factor in a regulated industry should be the amount of property behind the stock, he compared the $25 book value of Puget's common with WWP's "around $16" per share.

Stockholders Group Rapped . . . The week before throwing out the merger and purchase agreements, McLaughlin strongly criticized a stockholders committee battling in behalf of the merger.

"Puget's directors are thoroughly capable of protecting and advancing the welfare of all company stockholders," McLaughlin declared. "The attempted dictation of the directors' acts—and the indicated assumption of their prerogatives by a so-called 'stockholders committee'—are unjustified and uncalled for," he said. "This 'stockholders committee,' with the addition of a few more names, is the same group which about a year ago tried to cram a merger down Puget's throat on the basis of Washington Water Power's terms, and since then has been pressuring Puget to act as they call the shots."

The group referred to is headed by Laurence M. Marks of Laurence M. Marks Co., New York. Claiming to represent 600,000 of Puget's 2,177,879 outstanding shares, Marks said after McLaughlin's statement that his group will not abandon its efforts to bring

about a merger of the two private companies.

WWP Comes to Aid . . . Apparently thinking of this group, the Washington Water Power directors after meeting Nov. 13 at Spokane, declared "it is apparent that any further action on this matter must be taken by the Puget stockholders themselves for their own protection." The reasons McLaughlin gave for refusing to extend the agreement date were "fully presented" to the Washington Public Service Commission and "found by the commission to be without foundation.

"Puget's change of mind concerning the merger comes as a complete surprise," the statement continued, "and is certainly inconsistent with its numerous statements over the past several years, when it has repeatedly asserted that it was practically impossible for it to continue as a private entity."

The statement said WWP had made its merger offer and had extended the earlier termination date of July 30 to Nov. 19 "in good faith" and that Puget had requested the commission to issue a favorable order.

"Since the commission issued a favorable order without restriction of any kind on Oct. 19, Washington had every reason to expect that Puget would cooperate and continue to work out the other steps necessary to complete the merger," said the WWP statement.

SEC Proposes Easing Holding Company Taxes

A change in the rules governing allocation of consolidated income taxes to member companies in registered utility holding company systems is being proposed by the Securities and Exchange Commission. It may ultimately mean higher net earnings for holding companies.

Simply stated, the SEC proposal would amend the rules so that dividends received by one member of the system from another no longer would be counted in gross income for figuring federal corporation taxes.

Nov. 30 has been set as the deadline for further comments, although that date might be extended to allow petitioners more time to file opinions. The subject is controversial enough that formal hearings may be held. Plan is to get the formalities out of the way so the new rule will be effective for this tax year.

Today in Utility Finance

YIELDS (%)

Quality	Bonds			Preferred Stocks			Common Stocks		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
DATE 1953									
Nov. 12	**3.07**	**3.13**	**3.31**	**4.16**	**4.35**	**4.61**	**5.20**	**5.65**	**5.75**
Nov. 5	3.06	3.11	3.32	4.16	4.35	4.62	5.21	5.67	5.77
END OF QTR.									
3rd 1953	3.30	3.33	3.54	4.35	4.52	4.83	5.36	5.97	6.01
2nd 1953	3.34	3.46	3.64	4.47	4.70	4.88	5.52	5.93	6.10
1st 1953	3.15	3.23	3.39	4.16	4.41	4.66	4.95	5.24	5.50
4th 1952	2.99	3.03	3.15	4.06	4.22	4.59	4.98	5.33	5.62

Data: Reis & Chandler, Inc.

EARNINGS

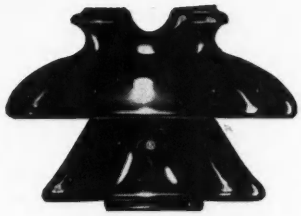
Company	Period Months Ended		Net Income 1953	Net Income 1952	Earnings Per Common Share 1953	Earnings Per Common Share 1952
California Electric Power, consolidated	12	Sept.	$2,813,762	$2,367,008	$.90(a)	$.90(a)
California-Pacific Utilities	12	Sept.	562,283	532,785	2.03(b)	2.00(b)
Columbus and Southern Ohio Electric	12	Sept.	5,410,703	4,409,955	2.27	1.98
Delaware Power & Light	12	Sept.	4,147,195	3,392,348	2.06	1.66
El Paso Electric	12	Sept.	1,647,501	1,563,003	2.07	1.96
Interstate Power, consolidated	12	Sept.	2,507,571	2,266,524	.94(a)	.84(a)
Lake Superior District Power	12	Sept.	1,003,919	923,150	....	....
Michigan Gas & Electric	12	Sept.	458,569	452,630	2.83	2.79
Northwestern Public Service	12	Sept.	930,868	917,081	....	....
Pacific Power & Light	12	Sept.	4,599,011	4,275,561	....	....
Potomac Electric Power	12	Sept.	6,127,948	6,271,681	1.11(c)	1.14(c)
Public Service Co of Colorado, consolidated	12	Sept.	8,139,710	6,809,972	2.47(e)	2.05(e)
Tampa Electric	12	Sept.	2,628,378	2,052,942	3.66	3.02

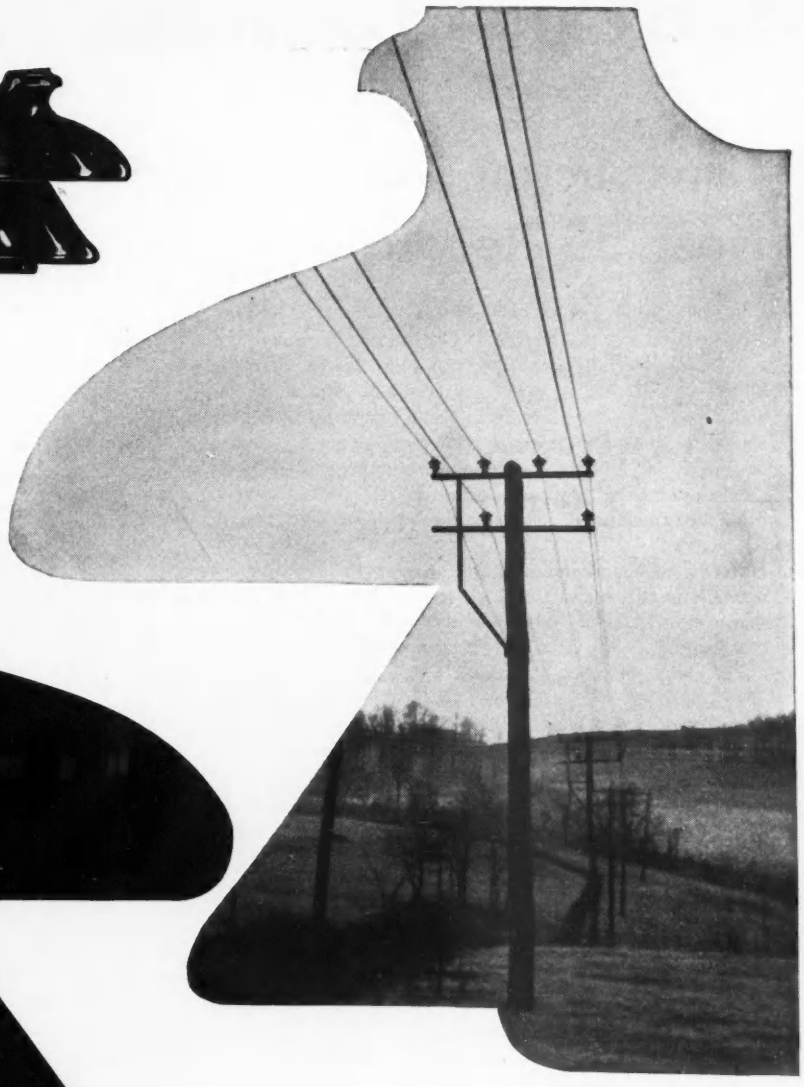
Notes—(a) Based on shares outstanding at end of period; (b) Based on 228,536 shares in 1953 and 223,941 shares in 1952; (c) Based on 5,117,040 shares; and (e) Based on 2,754,639 shares in 1953 and 2,750,900 shares in 1952.

FINANCING

Company and Description	Amount of Offering (000)	Offering Price	Yield to Public / Bid Date
WEEK OF NOVEMBER 12-18			
Preferred Stock			
Worcester County Electric—75,000 sh 4.75% $100 par	$7,500	.....	.....
Common Stock			
Columbus & Southern Ohio Electric—200,000 sh	.....	.....	.....
Iowa Southern Utilities—100,000 sh	.....	.....	.....
SCHEDULE FOR NOVEMBER—DECEMBER—JANUARY			
Bonds			**Bid Date**
Gulf States Utilities—1st mtg due 1983	$10,000	.....	Nov. 23
Illinois Power—1st mtg due 1983	20,000	.....	Nov. 23
Monongahela Power—1st mtg due 1983	10,000	.....	Dec. 1
Columbus & Southern Ohio Electric—1st mtg due 1983	10,000	.....	Dec. 1
Iowa Power & Light—1st mtg due 1983	8,500	.....	Dec. 2
Florida Power Corp—1st mtg due 1983	10,000	.....	Dec. 2
Philadelphia Electric—1st mtg	20,000	.....	Dec. 9
Appalachian Electric Power—1st mtg due 1984	20,000	.....	Jan. 11
Public Service Co of Indiana—1st mtg due 1984	25,000	.....	Jan. 12
Ohio Edison—1st mtg due 1984	30,000	.....	Jan. 19
Savannah Electric & Power—1st mtg	3,000	.....	.....
Consolidated Edison Co of New York—1st mtg	35,000	.....	.....
Central Illinois Electric & Gas—1st mtg	4,000	.....	.....
Preferred Stock			
Iowa Power & Light—50,000 sh $100 par cum (c)	$5,000(a)	.....	Nov. 24
Arizona Public Service—240,000 sh (b)	.....	.....	Nov. 24
Delaware Power & Light—232,520 sh (to be offered commonholders on a 1-for-7 basis, record Nov. 25 to expire Dec. 15; employees to be given right to subscribe up to 150 shares)	.....	.....	Nov. 25
Virginia Electric & Power—558,946 sh	.....	.....	Dec. 1
Duquesne Light—100,000 sh $50 par	5,000	.....	.....
Savannah Electric & Power—7,000 sh	.....	.....	.....
Central Illinois Electric & Gas—15,000 sh $100 par	1,500	.....	.....
Common Stock			
Maine Public Service—35,000 sh (to be offered commonholders on a 1-for-6 basis, record Nov. 24 to expire Dec. 8 with an oversubscription privilege)	.....	.....	.....
Central Illinois Electric & Gas—70,400 sh (to be offered commonholders on a 1-for-10 basis, record about Nov. 30)	.....	.....	.....
Consumers Power—679,436 sh (to be offered commonholders on a 1-for-10 basis, record Jan. 7 to expire Jan. 22; employees will be given right to subscribe)	.....	.....	.....
Ohio Edison—527,830 sh (to be offered commonholders on 1-for-10 basis, record Jan. 11 with an oversubscription privilege)	.....	.....	.....

Notes—(a) Company has asked FPC to exempt the issue from competitive bidding requirements; (b) First Boston Corp—Blyth & Co, underwriters; and (c) Smith Barney & Co, underwriter.





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Construction Will Stay Near '53 Record Level

Construction will run high in 1954. But prospects now are that the total will be lower than this year. If it is, that will be the first decline in total construction activity since the end of the war. Construction has been one of the strongest elements in postwar prosperity. It's gone up and up—risen even when the rest of the economy was slipping, as in 1949 (See chart). The expected decline is one of the factors calculated to cause a general slipping in business next year.

Nevertheless, construction will still be a basic source of strength in the economy. It's not expected to slip more than 5-6% from the record level of 1953. A decline of that size would leave dollar volume of new construction higher than in any year except 1953 and perhaps 1952.

Some Construction Up, Some Down . . . Trends in different types of construction vary sharply. Some will increase despite the general decline (See chart). But most of this strength is expected to be concentrated in state and local construction. Most types of private construction will probably dip along with most kinds of federal work.

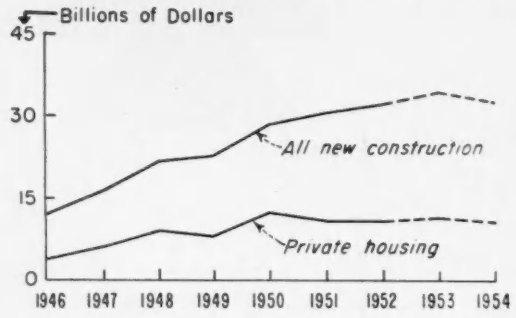
Commercial building is the striking exception to the general trend in private construction. Work on warehouses, offices, loft buildings, stores, restaurants, and garages shot up in 1953, increasing by 55% in the first ten months of the year. It will gain again next year—perhaps by as much as 10%. Need for regional shopping centers, office buildings and other commercial structures is great enough to keep this class of building high for several years more.

Industrial construction will be down next year, probably by 10-20%. It will be brought down by completion of many expansion programs started after the attack on South Korea. But the high level of business plans for new capital investment next year (EBO, Nov. 9) will prevent the decline from reaching the proportions feared earlier.

Housing also is expected to drop off. Lower incomes for consumers plus changes in family formation and migration may cut housing starts to some 900,000 next year compared with about 1,075,000 in 1953. (EBO, Oct. 26). But the homes built next year will be larger than those in 1953. So total dollar volume won't drop so much as starts. Home construction may amount to about $10.6 billion in 1954 compared with more than $11.7 billion in 1953.

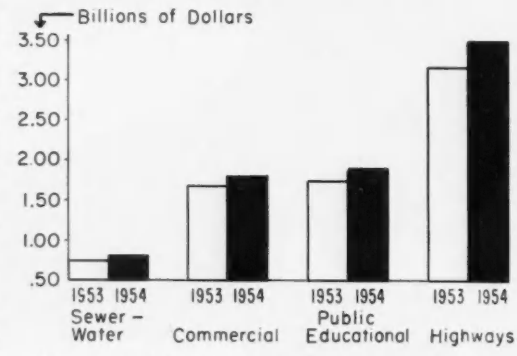
Electric utilities will be spending more for construction next year. But most other utilities will spend less—including gas, railroads, and probably telephone companies. The result will be a small drop in total private utility construction.

Construction Postwar Drop Looms . . .



Source: Dept of Commerce and McGraw-Hill, Dept of Economics

Although Some Types Will Rise



Source: Dept of Commerce and McGraw-Hill, Dept of Economics

More State, Less Federal Construction . . . Two strong trends dominate the public construction picture. One is a decline in federal construction—the other a rise in state and local construction. The change in federal work is likely to win out next year, bringing a small decline in total public construction.

Federal atomic energy work, military and naval construction, and conservation construction are all scheduled to decline. The $4 billion total this year may be less than $3.6 billion next year. Public housing work is also falling.

But state and local work is rising fast enough to offset most of this loss. Highway construction will be more than $3.1 billion this year, more than $3.5 billion in 1954. Spending for sewer and water facilities is also increasing as are expenditures for school buildings which are badly needed in certain areas where population has been rising rapidly.

The upswing in state and local work will remain a strong element in the construction picture beyond 1954. Needs have grown immensely since 1940 while construction has lagged badly because of wars and inflation in costs. Now the states and municipalities seem to be started on the road to more adequate construction programs.

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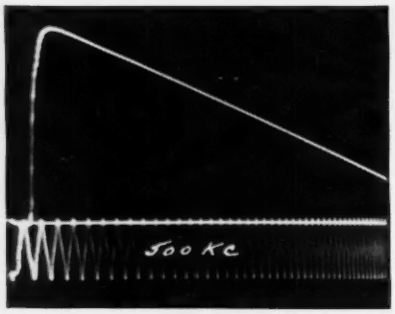
Proof of Performance for *Every* Standard Distribution Transformer



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Every Allis-Chalmers distribution transformer gets a fast, efficient vacuum treatment to remove air bubbles in windings and oil. The process also assures complete oil impregnation of all fibrous insulation before the transformer leaves the factory.

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The photo above shows the operation. While the core and coil unit is still hot from the dry-out oven, it is tanked and covered with hot oil. Then, immediately after final assembly, the vacuum draws out all moisture and any air bubbles locked within the transformer windings.

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